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ORIGINAL COMMUNICATIONS.

PARAVAGINAL OR ABDOMINAL OPERATION IN CARCINOMA OF THE UTERUS.*

BY

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(With one illustration.)

THE much-needed betterment of our operative results in carcinoma of the uterus may be accomplished in two ways. In the first place, the bringing about of conditions which favor earlier diagnosis would place in our hands the incipient cases of cancer which are more easily amenable to successful treatment. This, however, is a separate chapter and not germane to the discussion in hand.

The second way of improving the results of our therapeutic efforts lies in an improvement of our operative technic; and it is this last question which forms the sole object of this symposium.

I shall limit my remarks to the operative treatment of cancer of the cervix, first, because cancer of the cervix is about sixteen times more frequent than cancer of the body of the uterus (Kru-

*Read before the American Gynecological Society, May 25, 1905.

kenberg,[51] Waldstein);[115] second, because the operative results in cancer of the cervix have been, thus far, highly unsatisfactory and call most urgently for speedy improvement. Under the term "cancer of the cervix" shall hereafter be included carcinoma of both the vaginal portion and the cervix proper, since in most statistics no distinction between these two forms has been made; moreover, in many instances, the point of origin can no longer be determined.

A decided step toward an amelioration of the existing conditions seemed to have been inaugurated in 1900, when Wertheim,[119] revived the operation originally devised by Ries,[88 89] in 1895. The sensation created by this new movement is still fresh in our mind. The numerous changes, modifications and extensions, all of which were based upon the suggestion of Ries, are connected with many of the most illustrious names both in this country and abroad. Since in matters of this kind we should be governed not only by the weight of authority, an investigation of the principle underlying the different methods now included under the name of radical abdominal operation, is permissible.

Radical abdominal operation, generally speaking, includes the extirpation of uterus and appendages together with the excision of the parametria and a large portion of the vagina, and introduces, as an absolutely new feature, the routine ablation of the lymphatic system of the pelvis. The last-named point is based upon the assumption that in cancer of the uterus the pelvic glands soon become infected and that, in consequence of this early and widespread involvement, the glands when left behind would keep up the destructive disease, thus frustrating the effects of our operations. "Cervical cancer," says Mackenrodt,[61] "even in incipient stages, must be operated upon by the abdominal route, because it extends deep into the tissues, and almost always involves the parametria; the glands are early affected." v. Rosthorn[92] found that in 57.5 per cent. of his cases operated upon per abdomen, the hypogastric and iliac glands were involved. Jonnesco[36] found carcinomatous glands in 61.5 per cent. If it were proven that such a high percentage of glandular metastasis were the rule, the postulate to remove the lymph glands in all cases would theoretically be unimpeachable. But the view of Mackenrodt and other advocates of the radical abdominal operation has not been generally accepted. Kroemer,[47 48] on the strength of most painstaking researches, insists that "cancer of the uterus grows, as a rule, *in continuo* and infects the regional glands only in late stages after

the parametria and ligaments have become involved; . . . even at this stage the glands remain intact in half the cases." Cullen, himself in favor of the Wertheim operation,[14] states that "rarely in cancer of the cervix is there an extension to the lymphatic glands,"[13] and Clark,[9] has reached similar conclusions when he assumes that "glandular metastases are much less frequent than he supposed when he[8] originally described his own operation in 1895."

A. v. Rosthorn's statistics which have been frequently quoted in favor of the ablation of glands, are derived from a comparatively small material of 33 cases. While the correctness of v. Rosthorn's statements is beyond doubt, only a much larger material would permit of conclusive deductions in so important a question. For this reason the following tables have been prepared. Into these tables only such cases could be admitted as had been subjected to microscopic examination. Reports of carcinomatous glands diagnosed solely from their macroscopically enlarged appearance were omitted because we know from numerous investigations that "enlarged glands do not necessarily indicate carcinoma," and that "cancer may be present in very small lymph nodes which cannot be palpated." (Sampson.)[94] Wertheim[120] and Doederlein[15] found cancer only in enlarged glands. On the other hand, Courtois-Suffit,[11] Vinay,[114] Kelly[38] and others have shown that the enlargement frequently is due to a hyperplastic (Kelly)[38] or hypertrophic (Kroemer)[48] process, and again, Ries,[90 91] Sampson [94] and Schauta[97] emphasize that it often requires hundreds of serial sections to demonstrate the presence of cancer in apparently normal glands. The following cases, then, meet with the requirements of careful microscopic examination.

TABLE SHOWING THE PERCENTAGE OF GLANDULAR INVOLVEMENT IN CARCINOMATA UTERI, IRRESPECTIVE OF LOCATION.

Wertheim-Kundrat[54]	(80: 26)	33.7 per cent.
Doederlein[16]	(115: 26)	22.8 "
H. W. Freund[21]	(15: 4)	26.6 "
V. Rosthorn[92]	(33: 19)	57.5 "
Koenig[43]	(7: 0)	0.0 "
Mauclaire[67]	(6: 2)	33.3 "
Kleinhans[41]	(32: 9)	28.0 "
Zweifel-Glockner[25]	(59: 11)	18.1 "
Schauta[97]	(10: 2)	20.0 "
Oehlecker[71]	(7: 2)	28.6 "
Total	(364:101)	27.7 per cent.

In 1902, when reviewing the literature for a former publication,[24] I found a percentage of 33.6, but the difference is readily explained by the fact that I did not limit myself to cases verified by the microscope.

TABLE SHOWING THE PERCENTAGE OF GLANDULAR INVOLVEMENT IN CANCER OF THE CERVIX.

Wertheim-Kundrat[54]	(76:22)	28.9 per cent.
Doederlein[16]	(92:24)	26.0 "
Manteufel[65]	(33: 9)	27.3 "
Sampson[95]	(15: 6)	40.0 "
Total	(216:61)	28.2 per cent.

These 27.7 and 28.2 per cent. respectively, are derived from cases which had been subjected to operation. Oltramare,[74] quite recently, concludes from literature that uterine cancer affects the glands only in 20 per cent. Compared with v. Rosthorn's or even Jonnesco's statistics, these figures seem to be surprisingly low; yet, they are corroborated by the but slightly higher percentage as found by the pathologist upon the post-mortem table. Riechelmann[87] had in 86 cases, of whom there were only 14 operable ones, 30 cases of glandular involvement, *i. e.* 34.9 per cent. Kroemer[48] states that in Pfannenstiel's material which was, almost without exception, inoperable, the percentage of glandular involvement did not exceed 45, even though the parametria were always infiltrated. Schauta[97] found in 50 cases of whom 40 had died from cachexia, 32 cases of glandular metastases—64 per cent. This percentage of 64 seems not excessive considering the fact that the majority of these patients has been in the very last stages of cancer. An observation of Stolz[106] should here be recorded. This author ligated the hypogastric and spermatic arteries in 7 cases of inoperable cancer and found "on the whole, only insignificant changes in the glands." Nor is this observation unique. Under exceptional conditions, cancer of the uterus may exist even for many years without giving rise to glandular metastases. Odebrecht[70] reported a case of carcinoma which had existed for five years and four months and had left the uterine periphery intact. J. Hofmeier[30] made a post mortem six and a half years after hysterectomy for cancer. There was a recurrence in the left adrenal, with but minimal recurrences within the pelvis. No local recurrence was found. The pelvic cellular tissue contained only near the foramen obturatorium, on the left a small cancerous gland,

and, furthermore, a very small carcinomatous infiltration around the ureters. Katzenstein[37] exhibited a woman who had been suffering from cancer of the uterus for sixteen years, but showed no evidence of glandular affection.

On the other hand, extensive metastases in the glands have been observed in the incipient stages of cancer. Tiburtius[111] reported a very young case of carcinoma of the vaginal portion which was diagnosed only after microscopic examination; the parametria were quite normal, yet large carcinomatous infiltration of the glands around the iliac vessels and the aorta was found. Similar cases were recorded by Ries[91] and H. W. Freund.[21] But such instances are rather exceptional, and it may safely be assumed, from the observations enumerated above, that glandular involvement takes place only in the more advanced stages of the disease. How else can we explain the results obtained by Olshausen[72 73] with the simple vaginal hysterectomy? This author, who operated only when the cancer was limited to uterus and vagina, reported, in 1901, that of the 169 patients who had survived the operation, 38.85 per cent. had remained free from recurrence for five years. In this 38.85 per cent., surely, there was no glandular involvement present. As to recurrences after vaginal hysterectomy, it is a well-known fact that, in about three-fourths of all cases, they become evident in or near the scar in the vagina. In examining 58 cases of carcinoma of the collum as to the localization of the recurrences, Winter[125] found 54 "local" recurrences, near the scar, and only four genuine recurrences in the glands. In twelve of the local recurrences, there were coexistent glandular recurrences. Out of 115 cases of Mangiagalli,[64] cancer recurred, within three years after operation, in 79 cases. With the exception of one case, recurrence regularly took place near the scar. I anticipate the objection that local recurrences grow much more rapidly than glandular metastases; the patient dies from the local recurrence before the glandular involvement has had time to become evident. In this respect, Lomer's[57] paper is very instructive. Lomer treated 52 advanced cases with palliative excochleation and subsequent application of the thermocautery and observed, in many cases, that the disease did not produce glandular metastases. The same author collected from the German, French, English and American literature 149 cases, many of which were inoperable, which remained free from recurrence more than five years. All these cases had been operated upon by the thermocautery; the operations were either hysterec-

tomies, amputations of the vaginal portion or simple excochleations.

To sum up all the foregoing data, we may say that cervical cancer affects the pelvic glands only in less than one-third of all cases, and that the invasion practically does not take place until the parametria are infiltrated. The next deduction is that two-thirds of the cases do not require the removal of the glands incident to the radical abdominal operation. In about 66 out of 100 patients, this part of the operation would be unnecessary, nor is it possible to make a definite determination before or during operation. Palpation of enlarged glands is not feasible before operation and is, even after opening the abdomen, frequently impossible. Moreover, as we have seen above, enlargement does not necessarily mean cancer. Furthermore, the inconstancy and atypical localization even of normal glands within the pelvis is admitted by all authors, and Schauta[97] found in several cases that glands may be present even at some distance from blood-vessels.

All these difficulties would force upon us the risk of doing an unnecessary operation in two-thirds of the cases, in order to satisfy the principle of removing glands. In a hopeless disease, like carcinoma, even the most heroic measures may be justified provided the harm done does not outweigh the possible benefit to be derived. "*Primum non nocere*" must remain our highest aim, even in cancer. Thus, the propriety of routine ablation of glands will depend upon the following four points:

1. Mortality;
2. Morbidity;
3. Completeness of the operation;
4. Late results.

TABLE SHOWING IMMEDIATE MORTALITY OF RADICAL ABDOMINAL OPERATION.

V. Rosthorn[92]	(33: 3)	9.9 per cent.
Kleinhans[41]	(32: 3)	9.3 "
Zweifel-Glockner[26]	(59: 6)	10.2 "
Kroenig[50]	(8: 1)	12.4 "
H. W. Freund[21]	(15: 2)	13.3 "
Wertheim[122]	(120: 20)	16.6 "
Hofmeier[29]	(18: 3)	16.6 "
G. Klein[40]	(16: 3)	18.7 "
Mackenrodt[59]	(32: 6)	18.8 "
Sampson[95]	(15: 3)	20.0 "
Doederlein[15]	(34: 7)	20.6 "
Pozzi[81]	(34: 8)	23.5 "

Spinelli[103] (Italian statistics)	(200: 52)	26.0 per cent.
Pozzi[81] (French statistics)	(95: 26)	27.4 "
Kuestner[52]	(56: 17)	30.4 "
Jonnesco[36]	(28: 9)	32.1 "
Martin-Heinsius[66]	(16: 6)	37.5 "
Total	(812:175)	21.5 per cent.

The mortality ranges between rather wide limits, due to the nature of the material, the more or less extensive operation and, probably, also to the personal equation of the operator. Thus, v. Rosthorn[92] had in 33 cases a mortality of only 9.9 per cent.; while Duret and Bosson[17] record, in 23 cases, a mortality of 43.4 per cent. The average mortality of 21.5 per cent, is rendered even more discouraging if we remember that only in one-third of the cases the ablation of glands with all its dangers had been necessary.

The causes of death may be illustrated by a few figures. Winter[126] compiled 134 operations with 33 deaths. Of these 33 fatal issues,

18 were due to infection (sepsis, pyemia, peritonitis, retroperitoneal phlegmon), 12 to shock, 1 to after-hemorrhage from the vena hypogastric, 1 to intestinal invagination, 1 to pyelonephritis after necrosis of the uterus. Kuestner[52] noted in his 17 cases of death, 2 of embolism of the lungs, 2 of pneumonia, 1 of uremia, 1 of rupture of the abdominal wound, 11 of peritoneal sepsis.

As regards morbidity, Kermauner and Laméris[39] report that of 33 cases of v. Rosthorn, only 14 had an undisturbed convalescence. Aside from collapse immediately after the operation, there were noted cystitis, bronchitis (three times), abscess of the abdominal walls (four times), parametric abscess (three times), rupture of the laparotomy wound with prolapse of intestines (twice), injury of the bladder (eight times), necrosis of the bladder wall with formation of a fistula (once), ureteral fistula (twice) injury to the rectum (once). This report gives a fair picture of the multiplicity of complications during convalescence. All authors agree that after the abdominal radical operation, cystitis with its consequences, injuries to the bladder, ureters or intestines with formation of fistulæ and necrosis of the ureters are most to be dreaded. In addition, the extensive methods of operation, as have been devised by Mackenrodt,[59 61] Amann,[1] Poten[80] and others carry with them the danger of long lasting suppuration from the enormous cavities produced and from the large wounds in the connective

tissue. These complications are the more distressing as the patients, in most cases, are in a poor condition from the effects of the primary disease.

In order to answer the question whether the removal of glands is ever complete, we have to consider the technic evolved by different operators. Those authors who, like Wertheim[120] and Doederlein,[15] limit themselves to the extirpation only of macroscopically enlarged glands, can hardly attain a complete removal of the cancerous lymphatic system, since it is proved beyond doubt that the size of the glands is not absolute proof of the presence or absence of malignancy. Therefore, all the glands ought to be removed systematically and in continuity, and under no circumstances should small or non-indurated glands be left behind. This was the aim of the original suggestion of Ries; and the different methods subsequently devised strive toward the same goal. Among the advocates of this truly radical operation, in this country, the names of Clark,[81] Russell,[93] Humiston,[31] Irish,[33] and Sampson[95] may be mentioned. In France and Belgium, Lauwers,[55] Reynier,[83] Belloeuf,[4] Gouilloud, Pique,[79] Mauclaire,[67] and Ricard[85] work along similar lines. In Italy, Morisani[69] and, in Russia, Strauch,[108] put themselves on record in favor of the more radical methods. In Roumania, Jonnesco[36] practices a daring and extensive mode of extirpation. In Germany, finally, where the whole cancer question has received the most careful and thorough consideration, v. Rosthorn,[92] Amann,[1] Poten[80] and most of all, Mackenrodt,[59] have designed methods by which a complete clearing out of the entire pelvic cavity with all glands and connective tissue is intended.

It is frankly admitted by all opponents to these radical measures that the theory of the systematic removal of glands is unimpeachable. But the accomplishment of this theoretical demand is open to many and important objections. In the first place, is it possible to remove all glands regional to the uterus? Olshausen,[72] Hofmeier,[29] v. Ott,[75] Richelot,[86] Sinclair,[102] Carstens[7] and others simply deny the possibility of such a procedure. No matter how careful we are, we are bound to leave some of the glands or some of the lymph channels behind. It is and will be an illusion to pursue the cancerous invasion throughout the pelvis. It is not even possible to extirpate all carcinomatous or even suspicious glands. Staude[105] illustrated this in four post-mortem examinations made subsequent to operation. For the earch for, and ablation of, one markedly affected gland, the resection of a portion of the radix mesenterii would have been required. A small gland

underneath the hypogastric artery is always found in post-mortems, but cannot be detected by the searching operator on account of its locality. Nearly all post-mortem records have so far shown that whenever carcinomatous glands were removed during operation, other involved glands were almost invariably overlooked. As to the lymph vessels, the excellent technique of their removal as designed by Peiser,[76] is feasible on the cadaver, but, according to Staude, impossible in the living.

By most of the methods recorded, the hypogastric, external iliac and common iliac glands, which three groups are usually comprised under the name: iliac or hypogastric glands, and furthermore, the sacral glands may be removed. By the methods of Strauch, Sampson, Amann and, chiefly, Mackenrodt, also the inguinal and obturatorial glands are accessible. The lumbar glands above the bifurcation of the aorta are commonly considered to be inaccessible. Mackenrodt says in this respect: "The inner inguinal glands are the first involved, then the obturatorial glands, and, finally, the hypogastric and iliac glands. The affection of glands still higher up in the pelvis, which is not infrequent, cannot be considered from a surgical standpoint; such cases are hopeless." Jonnesco is the only one of all operators who attacks these lumbar glands. Kermauner and Laméris found that, in 33 cases of v. Rosthorn, the lumbar glands were involved in 9 per cent. Schauta[97] arrives at a somewhat different conclusion. This author, in cooperation with Hitschmann, has published the results of his researches, which surpass in thoroughness even the painstaking and admirable investigations of Kundrat,[54] Kroemer,[48] and Kermauner and Laméris.[39] In 60 cadavers of cancer patients all glands were removed. These glands numbered 1,182, which were cut into about 160,000 serial sections. Schauta divides these glands into two groups; the "first etappe" constituting glands which are accessible to operation, the "second etappe" comprising the inaccessible glands. The first etappe is composed of the iliac and sacral glands; the second etappe is formed by the glandulæ lumbales, the glandulæ cœliacæ (along the aorta upward from the renal arteries), and the superficial and deep inguinal glands. The inguinal glands are accessible, but are attacked but by a few operators (Mackenrodt, Amann, Strauch, Sampson, etc.). In 35 per cent. of his cases the glands of the second etappe were found involved concomitantly with those of the first etappe, while in an additional 8.3 per cent. they were carcinomatous, the glands of the first etappe being free. This gives a total of 43.3 per cent. in

which the inaccessible glands were involved; in other words, the removal of the regional glands would have been unsuccessful in 43.3 per cent. In another 43.3 per cent. of his cases, no glands, either of the first, or second etappe, were involved, so that only in the remaining 13.3 per cent. where the first stappe was affected, the second etappe being free, would an operation with ablation of glands have been indicated. Schauta, then, draws the conclusion that as soon as glands are involved in uterine cancer, their complete removal is possible only in extremely rare cases.

Schauta's statements are corroborated by a number of separate observations. Kuestner[53] found, in a case of cervical cancer, the coeliac glands behind the duodenum swollen to such an extent that they compressed the ductus choledochus, thus producing intense icterus. Bakes,[2] Zweifel,[129] and v. Herff[27] observed intra- and retroperitoneal glands involved; in v. Herff's case, the pelvic glands were, as yet, intact. It is noteworthy that, although the attention of the operators has only recently been drawn to such "high" glands, quite a few observations of this character have already been recorded. Williams[124] points out that in advanced cases of cervical cancer, the lymph glands of the supraclavicular region are apt to become enlarged (Troisier's symptom). His statement is supported by Petit,[77] v. Ott,[75] and Beckmann.[3] The latter, in particular, observed a case of primarily cervical cancer with infiltration of the parametria in which a carcinomatous infiltration of the supra- and infraclavicular glands forming a tumor of considerable size existed.

These insurmountable obstacles due to anatomical conditions are freely recognized by many of the leading authorities and find a precise expression in the dictum of Kroemer;[48] "A radical extirpation of the lymphatic organs regional to the uterus is impossible." Nor is the complete removal of the lymphatic system within the region of the accessible glands of the first etappe always possible. In this connection, we have first to speak of the lymph channels leading to or interconnecting the glands. Some authors (Menge,[68] Kroenig[49]) do not attach great importance to their removal as the floating cancerous elements do not settle within the lymphatics. It is true that it is difficult to demonstrate microscopically cancer particles adherent to the walls of lymph vessels, but numerous observations (Mackenrodt,[58] Selig,[101] Russell,[93] H. W. Freund,[21] Kermauner and Laméris,[39] Veit,[112] Schauta[97]) prove the existence of such deposits within the lymph vessels. Chrobak[10] and Herzfeld[28] pointed out that the lymph flowing

through the various channels and lymph vessels is impregnated with fragments of carcinoma. I suggested in a previous publication[24] that, when these lymph vessels are opened at the operation, the escaping lymph fluid may give rise to a recurrence. It is, then, but logical to demand that the lymph vessels should be removed in continuity with the glands. Mackenrodt, Amann, v. Rosthorn, Sampson and others have accomplished this task, while Kuestner and Wertheim found it impracticable because the connecting lymph tracts usually were torn.

Furthermore, the extirpation of accessible glands may present insurmountable difficulties. V. Franqué[18] remarks that in 20 of 27 cases, the glands either were not carcinomatous, as found by microscopic examination, or could not be removed at all. In some of Kuestner's[52] cases, the extirpation of glands could not be accomplished or was done but incompletely on account of firm adhesions to the iliac vessels. "The carcinomatous glands," says Ries, "are sometimes firmly adherent to the large blood vessels, especially the veins, and the adhesions may be so firm that in the attempt to separate them, the blood vessel is torn. This form of attachment is probably due to cancerous invasion of the blood vessels." It occurs to me that under such conditions any operation would be utterly useless. Wertheim, Funke, Ries and others have encountered these difficulties and accidents. In one of Ries's cases the enlarged and firmly adherent glands could not completely be ablated; during the efforts at dissection, the external iliac vein and hypogastric artery on the left were severed and the patient died from hemorrhage.

Of course, the fear of injuring the large vessels or of encountering other technical difficulties must not deter us from adopting a new operative method provided it is justified by the ultimate result. Considered from this standpoint we are brought face to face with the question: Has the systematic removal of glands improved the final results of the less radical methods?

The radical abdominal operation is only a few years old. One or two more years must elapse before we can obtain statistics covering five years, which period has been fixed by the consensus of opinion as the limit for definite cure. A few remarks on recent developments of statistics as a science may be *à propos*. Statistics is no longer, as W. A. Freund termed it, "the vilest prostitute"; nor does it justify any longer Talleyrand's dictum: "La statistique c'est le mensonge en chiffres." At the present day, statistics has become an exact science and is of the greatest value in almost all

questions of investigation and competition; and particularly in the cancer problem, we would be completely at sea, had we not reliable statistics at hand from which we could draw our conclusions. To Winter[126] belongs the credit of having systematized the collection of cancer statistics. He introduced the "absolute Heilungsziffer" (absolute percentage of cures) into our calculations. His mode of compiling statistics was completed and improved upon by Waldstein,[117] whose suggestions are now accepted by many (Wertheim, Glockner, Kroemer). Werner,[118] recently, has simplified the somewhat complicated formula of Waldstein. He demands that in future all statistics which claim recognition should give the following four figures:

1. How many women, in a given clinic, have been admitted for cancer?

2. How many of these have been operated upon?

3. How many of the operated women have died after operation?

4. How many of those who survived the operation, are cured after five years?

We, then, obtain the "absolute Heilungsziffer" by computing the ratio of figure 4 to 1.

According to Werner, the following exceptions must be made:

(a) Those cases which are yet operable, but do not submit to an operation. Their number will be but small. They should be left out entirely, because a patient who does not submit to treatment is like one who has not sought treatment at all;

(b) Those that have died from intercurrent diseases or cannot be traced. In doubtful cases, they should be counted as recurrences.

(1) If, however, a case has been under observation for five years without a recurrence, she is considered cured irrespective of her future condition, or whether she can be located or not.

(2) If a patient dies two years after operation from an intercurrent disease and careful post-mortem fails to detect the slightest trace of a recurrence either in the scar or in the glands, she can be counted as cured. If, however, such negative post-mortem findings be made before the end of two years, the patient should be counted as recurrent. All patients who die within the first five years after operation from an intercurrent disease, no post-mortem being made, and all cases lost from observation within this period, must be considered as recurrences.

It goes without saying that in every case the diagnosis of cancer must be supported by microscopic examination.

It is at once evident that statistics which comply with these postulates will be practically exempt from all objections and will give a true picture of the efficacy of the respective method of operation.

If we now return to the question whether the radical abdominal operation has improved the absolute percentage of cures, we must admit that, as yet, no statistics covering five years and complying with the above premises has been published. But from scattered reports we may entertain grave doubts as to the final superiority of the new method.

Pfannenstiel[78] saw 2 recurrences in 7 surviving patients; the condition of the remaining 5 was uncertain, the oldest case being only 16 months after operation. Winter[126] compiled 108 cases of 11 operators. Of these 108 cases, 45 (41.6 per cent.) became recurrent within the first year. "This percentage cannot be utilized in the consideration of the value of abdominal operation because a large number of cases which have been pronounced well have been operated upon too recently. The fact, however, that after so short a time 41.6 per cent. have become recurrent, does not justify us in raising too optimistic expectations for this operation."

Wertheim,[123] who figures in these statistics of Winter with no recurrences at all, has meantime reported that almost all cases in which the extirpated glands were found to be carcinomatous have become recurrent. Belloeuf,[4] who strongly urges the adoption of the radical abdominal operation, admits that the evacuation of the pelvis usually remains incomplete, and that recurrences very early take place. Humiston[31] sees in the complete removal of all the lymphatics the only chance against a recurrence of carcinoma. In 1898 he operated upon three cancers of the cervix; all three became recurrent. In the second of these cases he made a most careful dissection of the glands along the iliac vessels and removed every particle of fatty substance at the base of the broad ligament. This patient died in four months with general involvement of the lymphatic system. Of 13 cases of Kouwer,[44] 8 survived the operation, 2 became recurrent within three years, while the six remaining disappeared from observation. In Veit's[113] cases in which the enlarged iliac and lumbar glands were extirpated, recurrence invariably took place. Zweifel[129] removed cancerous glands in 6 cases. One of these died after operation. Of the remaning five, recurrence was manifest in two cases, four months subsequent to operation. In both the recurrence took place in

that side from which the glands were removed. Légueu[56] had 6 recurrences in 6 operated cases. Faure[19] saw one recurrence among his three patients. Of the 13 operated cases of Terrier[110] 10 became recurrent. Jacobs [34] saw after radical abdominal operation as many recurrences as after vaginal hysterectomy.

V. Rosthorn advocates a very extensive removal of the lymphatic system; yet, Kermauner and Laméris, who worked up his material, express themselves rather skeptically as to the ultimate results in consideration of the fact that 4 cases of local recurrences and 1 of glandular recurrence have already occurred within the first year. At the International Gynecological Congress in Rome, 1902, Pozzi[81] emphatically declared that the abdominal operation is not justified if performed solely on account of the fear of glandular involvement. "The abdominal operation," says Winter,[128] "can, theoretically, accomplish more than any vaginal method in that it enables us to remove lymph glands and the outermost portions of the parametria. From a practical standpoint it has, thus far, only proved that it is more dangerous." It has been shown above that even the most extensive operations have, in many instances, failed to prevent recurrences. On the other hand, less complete procedures have resulted in permanent freedom from recurrences. We should, therefore, bear in mind that in our cures certain factors still unknown to us are at work, and we should not exclusively consider the more technical points. If we are forced to make great and dangerous accidental wounds in order to prevent all metastases theoretically possible, the cost is no just proportion to the gain, especially if we operate in regions which, by their very nature, do not permit of real radical operations. The future of operations for uterine carcinoma, then, will be to attack early, vigorously and thoroughly the primary seat of the disease and its nearest surroundings (Schuchardt,[100] Chrobak).[10]

All the foregoing data and arguments can be condensed in a few sentences. In only about one-third of those cases which generally are considered "operable" are the pelvic lymph glands involved. To indiscriminately remove them in every case would mean to subject the remaining two-thirds to an unnecessary operation. Yet, we possess at present no positive method to distinguish cases with affected glands from those with normal glands. The ablation of glands is fraught with considerable danger which increases proportionately to the extent of their removal. This danger finds expression in the high mortality and the frequent

disturbances of convalescence. The extirpation of glands is almost always incomplete. Where carcinomatous glands are removed, other equally involved glands are almost certain to be left behind, both for anatomical and technical reasons. Because of this, the remote results of the extirpation of glands have thus far failed to come up to the expectations raised. Consequently, the systematic search for, and routine ablation of the pelvic glands in carcinoma of the cervix uteri should be abandoned.

Therapeutic measures regarding the lymphatic system in uterine cancer have been the focus of our interest to such an extent that its discussion had to be somewhat lengthy. On the other hand, the rôle of the parametrium, and the necessity of extirpation in carcinoma of the cervix are undisputed. Cancer of the cervix involves the parametria at an early stage. To be more precise, cancer of the vaginal portion (squamous-cell carcinoma of Cullen[12]) exhibits the tendency to spread to the vagina or to the paravaginal tissue, whence it invades by continuity the connective pelvic tissue. Cancer of the cervix proper (adenocarcinoma of Cullen) advances even more rapidly; it extends, as a rule, in a horizontal direction outward through the walls of the cervix directly into the parametria. As mentioned above, more than four-fifths of the recurrences after vaginal extirpation were found to be in or near the vaginal scar. Winter,[125] in studying such "local" recurrences in 32 cases of carcinoma of the cervix, found 24 cases of adenocarcinoma and 8 squamous-cell carcinoma. Such recurrences were doubtless in part due to an unrecognized involvement of the parametrium prior to operation. It was left for the painstaking researches of the last few years to furnish us with accurate figures regarding the percentage of involvement of the parametria. Cullen[12] states that in nearly every case of adenocarcinoma of the cervix observed in Johns Hopkins Hospital the disease had extended to the broad ligament. Kroemer[48] found in his material, which happened to be altogether inoperable, that in every instance the parametria showed carcinomatous infiltration. Kundrat[54] published his studies on the parametrium in cancer. He examined 80 uteri extirpated by Wertheim. The 160 parametria were cut into more than 21,000 sections and carefully examined under the microscope. He found carcinoma in 44 of the 80 cases, *i.e.*, in 55 per cent. Kermauner and Laméris[39] made similar investigations in v. Rosthorn's material. They found the parametrium involved 24 times in 33 cases (72.7 per cent). Schauta[97] finally found, in 96 cases, one or both parametria diseased 64 times (66.7 per cent).

Clinically, the infiltration of the parametria is not necessarily evidence of carcinoma, and, on the other hand, soft and apparently normal parametria may contain cancer. Realizing, then, that clinical examination alone does not give sufficient information as to the condition of the parametria, the figures involved above gain in importance.

We must conclude that in the great majority of cases of cervical cancer recurrences can only be prevented if, as Kelly expresses it, we give the cervix "the widest possible berth." This, however, is absolutely impossible if we employ either the simple abdominal hysterectomy or the simple vaginal extirpation. In either of these operations we extirpate the uterus close to its attachments. Both methods are no longer justified in cancer of the cervix. We must look for methods which enable us to widely excise the parametria. To comply with this postulate we may operate either through the abdomen or through the vagina.

This object may be accomplished with any of the methods comprised under the name of radical abdominal operation, provided they do not include the feature of glandular extirpation, which we have concluded to be superfluous. Of these operations, the methods of Mackenrodt, Amann, Jonnesco and Poten seem unnecessarily extensive and offer great chances of infection in the wide connective tissue wounds made. Wertheim's method, on the other hand, meets all requirements and is undoubtedly apt to remove radically and easily not only the entire parametrium, but also the vagina with the paravaginal tissue. This method, however, has all the disadvantages that are peculiar to laparotomies. Like every other abdominal operation, it is accompanied by shock, which increases proportionately to the duration of the operation and to the unavoidable manipulations with the intestines. As the peritoneal cavity remains exposed for a longer or shorter period, the danger of infection is greatly increased. The prolonged and exaggerated Trendelenburg position, which is a *conditio sine qua non* in this operation, gives rise to certain dangers with which we have become acquainted through the investigations of Franz.[20] Stone[107] recently reported a case which had been under anesthesia for three hours, during two hours of which she was in Trendelenburg position, and he attributed to this the exitus of the patient on the third day. Post-operative cystitis is, as we know from the studies of Taussig[109] and others, a regular and much dreaded sequel of the radical abdominal extirpation. Ileus is far more frequent after abdominal than after vaginal operations. In laparotomy, further-

more, we have an abdominal scar which, in a certain percentage of cases, may give rise to hernia.

These disadvantages do not contraindicate Wertheim's operation, because they are encountered more or less in all laparotomies. They may, however, influence our choice if we have at our disposal another operation which can accomplish as much, yet is not attended with as many disadvantages. Such a method has been devised by Schuchardt[98] in 1893, and is termed paravaginal operation. The most prominent feature of this operation is a deep incision through the wall of the vagina into the cavum recto-ischiadicum and downward through the perineum parallel to the rectum. More or less deep perineal incisions have been practiced by various operators (Mackenrodt,[23] Fritsch,[78] Duehrssen,[78] Jessett,[65] Purcell,[82] Pfannenstiel[78]); but, as Sinclair[102] justly remarks, it is not fair to speak of Schuchardt's method as a mere extension of these incisions. On the contrary, the paravaginal method is a distinct advance in surgical technique. As this operation seems to have been practiced but little in this country, a description of its technic will be in place.

With the forefinger and the thumb of the left hand, the operator seizes the posterior portion of the left labium, while an assistant seizes the parts in the middle line and puts them on the stretch. The operator then makes the incision between the two sets of fingers and, as far as possible, divides at one stroke in a forward direction the vaginal wall up to the left side of its insertion into the portio and downward and backward to the middle of the coccygeal region. The incision, thus, splits the whole vaginal tube, the left labium, the paravaginal and pararectal tissues, the levator ani and coccygeal muscles, the cellular tissue of the ischiorectal fossa, as well as the skin of the perineum and of the lateral anal region down to the sacrum. The wound in the pararectal tissue is situated to the left only so far that the rectum and sphincter ani are not injured. It lies only about a finger's breadth from the middle line. The incision on the left side is more convenient for the right-handed operator; only when a portion of cancerous rectum must be removed with the cancerous vaginal wall does a bilateral incision become necessary.

Schauta[96] and Sinclair[102] recommended, in contradistinction to Schuchardt, to at once stop the copious hemorrhage from venous plexuses. Schauta, then, catches the vagina as far as possible away from the cancer, with vulsella in a circular direction. Below these vulsella a circular incision is made through the vagina con-

necting with the paravaginal cut. Now the vagina is dissected off upwards and the cuff thus formed sewed over the portio vaginalis. The sutures are left long and serve, during the following steps of the operation, as guides. The bladder is now separated partly by scissors, partly by blunt dissection. Douglas' space is then opened behind, the left forefinger is passed behind first one and then the other parametrium, to drag it within easy reach, and the parametrium and broad ligament on each side are ligated, as far outward as possible, with strong catgut.

The effect of the paravaginal incision is surprising. In place of a vaginal tube we have before us a shallow excavation not deeper than one inch, and at the bottom of this the parametria are seen in full extent and within easy reach.

"The closure of the wound begins with the suture of the corresponding edges of the peritoneum with catgut, the cut ends of the broad ligaments being drawn towards the vagina and fixed there by sutures." . . . Schuchardt did not employ drainage. He sutured the vaginal wound loosely, but in the skin wound he inserted numerous sutures. "Almost without exception first intention of the whole wound takes place, and such a perfect *restitutio ad integrum* that by-and-by scarcely a trifling cicatrix can be seen." I can only confirm this last statement, although in the few cases in which I had occasion to employ Schuchardt's method, I drained the bottom of the wound with a narrow iodoform gauze strip.

Schauta[96] [97] gives most valuable suggestions for dealing with the bladder and the uterus, for which the original articles should be consulted. Any manipulation about the ureters will, according to Clark, be greatly facilitated by insertion of catheters into the ureters previous to operation.

The advantages of this paravaginal hysterectomy are the following: The patient, who is usually in poor condition, is by a vaginal operation subjected to considerably less shock than by an abdominal operation. The operation offers less danger of infection than does a laparotomy. Extensive statistics have shown that abdominal, and not vaginal operations as Reynolds[84] believes, have a greater percentage of infection. The intestines not having been handled, post-operative complications are less to be expected. No scar with the possibility of a future hernia is made. With these advantages over abdominal operations in general, the paravaginal method affords easy access to the cervix and parametria, the seat of the disease. These parts, if the paravaginal incision has been

done *lege artis,* are as superficial as, for instance, the breast with its surroundings in the Halstead operation.

The dissection of the ureters undoubtedly affords the greatest technical difficulties. With the necessary experience, however, this part of the operation can readily be effected, especially if we employ, after the example of Clark, preliminary catheterization of the ureters. The question of dealing with the ureters is a much disputed chapter. Kroemer,[48] Kundrat,[54] and recently Bovée[5] and Mackenrodt,[63] believe that the ureter, even if immured in cancerous parametrium, is not necessarily involved and can be dissected out with impunity. Other authors (Bumm,[6] Sampson[95]), rather than take the risk of leaving particles of cancer behind, prefer to remove the ureter together with the parametrium in which it is embedded. In the few cases on which I operated by the paravaginal method the ureter could easily be pushed aside. I should, however, not hesitate to sacrifice the parametric portion of the ureter if surrounded by cancerous parametrium. Most authors endeavor to implant the ureter in the bladder immediately after resection. This procedure seems to be open to the objection that the patient usually is so exhausted that any prolongation of the operation should be avoided. After a few weeks, when the organism has recovered from the effects of the primary disease, an implantation, no matter by what method, seems preferable.

The operability with the paravaginal method is, on the whole, identical with that of the radical abdominal operation. The index is usually given by the condition of the parametria. If the latter are infiltrated in their entire length, an operation by any method is considered hopeless. A small zone of clinically free parametrium on the pelvic wall is the premise for the possibility of an operation. From this standpoint we may compare the operability in the two methods. Wertheim[122] had an operability, at first, of 29 per cent., which afterwards increased to 40, 52.9 and 50 per cent., *i.e.* an average of 42.9 per cent. Schauta,[97] on the other hand, subjected 44.3 per cent., and Schuchardt[99] 56 per cent. of the cases examined to the paravaginal operation. It follows that the paravaginal operation is not less efficacious than the radical abdominal operation. By the former, of course, we are unable to remove any glands, but this procedure is, as shown above, unnecessary in the majority of cases, and, when necessary, not practicable. When the entire parametrium is involved it is doubtful if any method gives permanent relief. The following table shows that the immediate danger to

the life of the patient is proportionately not high with the Schuchardt operation.

TABLE SHOWING IMMEDIATE MORTALITY AFTER PARAVAGINAL OPERATION.

Schuchardt[99]	83 : 8	9.6 per cent.
Schauta[97]	91 : 11	12.0 "
Staude[105]	51 : 9	17.6 "
Total	225 : 28	12.4 per cent.

The paravaginal method is not exempt from accidental injuries, but their number is not great. Schauta[97] had in 121 operations 12 injuries (10 per cent).

For the question of the late results of the paravaginal operation, only the statistics of Schuchardt[99] are, thus far, available, because the cases of the other operators have not yet passed the five-year limit. Of 25 cases of Schuchardt which comply with this postulate, 10 (40 per cent.) were permanently cured. Winter calculates an average of 29 per cent. cure, five years after the ordinary vaginal hysterectomy for cervical cancer. The difference between this figure and the 40 per cent. of Schuchardt is due to the extirpation of the parametria by the paravaginal method. This means already an improvement of 11 per cent., and further improvement will, in all probability, be derived from increased personal skill and judicious selection of cases for operation.

I have omitted to place the corresponding percentages of mortality, morbidity and absence of recurrence after the radical abdominal operation next to those of the paravaginal method, because it is not my intention to construct an antagonism between the two operative procedures. Both methods are fully justified; both can stride side by side toward the common goal; and the choice of either procedure will to a great extent depend upon the personal equation of the operator.

In outlining the principles which should lead to an improvement of operative results in uterine cancer, Winter [126] said: "The chief object is the avoidance of local recurrences. This can be accomplished, first, by the most extensive extirpation of the parametria; second, by the prevention of implantation."

The first of these postulates is carried out by the paravaginal as well as by the radical abdominal operation. The second postulate was fulfilled by the use of the thermocautery in the preparation

of the cervix uteri, and, furthermore, by the exclusive application of the cautery in the extirpation of the uterus. As is generally known, Mackenrodt was the first to extirpate the carcinomatous uterus exclusively with the cautery. This operation, termed "igniextirpation," gave in his hands very promising results, which were presented by me in a monograph[23] in 1898. He obtained an operability of 92.9 per cent., with an immediate mortality of 17.9 per cent. Of the surviving 31 cases, 18 (58 per cent.) remained free from recurrence from three and one-half to six and one-half years. In spite of these results, which have not been surpassed by any other method, Mackenrodt relinquished the igniextirpation in the hope of obtaining, if possible, even better results with his radical "laparotomia hypogastrica." Knauer,[42] in 1901, reported 45 cases operated upon in Chrobak's clinic by igniextirpation. Of these 45 cases, 2 died (4.4 per cent. mortality). Of the remaining 43 cases, 1 died of tuberculosis and 3 were lost sight of, so that 39 cases can be utilized for statistics. Of these 39, there were 33 cases of cancer of the cervix; 14 became recurrent (42.4 per cent.); 19 remained well from 1 to 4 years (57.5 per cent). Although this high percentage will, no doubt, decrease within the next years, the remarkably good effect of this cautery operation is evident. In America, Byrne, by his untiring efforts, has done much to popularize hysterectomy with the thermocautery.

The principal effect of igniextirpation is the prevention of implantation. Moreover, the interesting observations of Lomer[57] make it probable that heat in some unknown way brings about the destruction of cancerous tissue, even at some distance from the point of application.

The paravaginal method can well apply the cautery to prevent a certain number of recurrences, which are not the result of nonradical operation, but of implantation of living carcinomatous cells into the open blood and lymph vessels of the operative wounds. Such a suggestion has, as far as I know, been made only by Knauer. The accompanying photograph shows a uterus recently extirpated by me by this method, and clearly demonstrates that the parametria can be removed in their entire extent. Whether we use a Paquelin or galvanocautery, or employ Skene's or Downes' clamps, is but a question of detail. The essential part of the procedure is the protective crust over every cut surface brought about by intense heat. Theoretically, combined paravaginal and igniex-

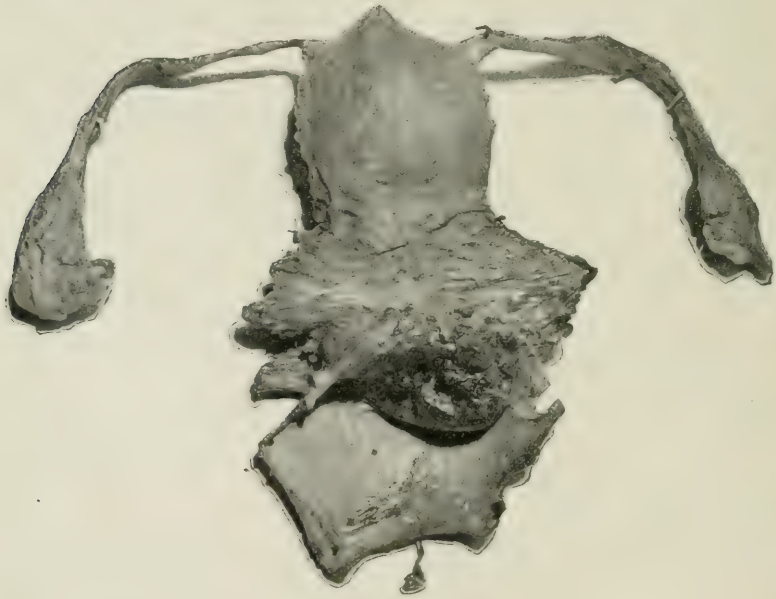
tirpation promises results which may excel the best thus far obtained.

CONCLUSIONS.

1. The object of this symposium is to discuss how we may improve our operative technique in order to better our results in uterine cancer.

2. The following conclusions apply only to cancer of the cervix uteri.

3. The radical abdominal operation, as far as the routine removal of the lymphatic organs of the pelvis is concerned, has thus far failed to yield the desired results.



4. On the other hand, the eradication of the parametria has been found to reduce greatly the percentage of recurrences.

5. Consequently, the simple abdominal and vaginal operations which do not include this procedure must be discarded.

6. For the extirpation of the parametria, Wertheim's method is the best of the abdominal operations.

7. It has, however, I believe, certain disadvantages compared to the paravaginal method of Schuchardt.

8. Considering the encouraging results of igniextirpation, a

combination of thermocautery with paravaginal extirpation gives promise of further improvement in operative results.

After all that has been said above, it follows that the title of this symposium should not be "Radical abdominal operation *versus* vaginal operation for carcinoma uteri, but should read:

Radical abdominal *or* paravaginal operation for carcinoma of the uterus.

ADDENDUM DURING CORRECTION.

The paper of Baisch (*Arch f. Gyn.*, Vol. 75, 1905) appeared too late to be considered in the foregoing. This article, embodying the investigations and experiences made in the university clinic of Tuebingen, supports the radical abdominal operation. The long-expected researches and observations of Mackenrodt, recently presented by him and Brunet to the Gynecological and Obstetrical Society of Berlin, February 24, 1905, have not yet appeared in print. A very important paper on our subject has just now been published by Sampson (*Albany Medical Annals*, May, 1905). This author, who had heretofore been one of the strongest advocates of radical abdominal operation with eradication of all glands, has now arrived at different conclusions. He realizes that it is operatively impossible to remove all the abdominal and pelvic lymphatics, and no longer lays stress on the systematic ablation of glands. Only "*if* at the close of the local operation *the patient is in good condition*, . . . is the removal of the easily accessible iliac lymph nodes indicated, for it is of grognostic value any way, and is undoubtedly of some curative value in a small percentage of the cases."

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TUBERCULOSIS AND PREGNANCY.*

BY

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The subjects, tuberculosis and pregnancy, may be conveniently discussed under the following heads:

1. Physiology of pregnancy.
2. Pathology of tuberculosis.
3. Tuberculosis occurring during pregnancy.
4. Pregnancy occurring in the tuberculous.
5. Prognosis.
6. Treatment, including prophylaxis.
7. Advice regarding marriage, nursing, etc.

I. THE PHYSIOLOGY OF PREGNANCY.

In discussing the physiology of pregnancy, it is not necessary to describe the changes in the genitalia. We may, however, refer briefly to the general changes that occur in the various systems of the body.

Respiratory System.—During pregnancy, especially in the later months, there is diminished chest expansion, which reduces the elastic contraction of the lungs upon the vessels of the lesser circulation. The lungs become shorter but broader, so that normally there is very little alteration in the lung capacity, and respiratory insufficiency is not marked. It may, however, be augmented even to the point of becoming absolute, under certain conditions, for instance, in the presence of calcification of the costal cartilages, when hydramnion or multiple pregnancy exists,

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or when cardiac, renal, or pulmonary disease occurs. It is stated that examination of the expired air shows increased elimination through the lungs. At the time of parturition, increased demands are made upon the lungs, especially during the second stage. There is marked congestion of the lungs during labor. The frequency of involvement of the larynx during the later part of pregnancy has been remarked. There seems to be some unexplained relation between the larynx and the uterus, possibly analogous to the so-called genital spots in the nose. After parturition there is a relatively increased respiratory capacity, permitting slower movements of respiration.

Circulatory System.—In tuberculosis, the heart is as important as the lungs. In pregnancy we would expect to find the heart hypertrophied, because of the increased blood mass and the greater demand made upon the heart by the pregnant uterus. However, it has been claimed by competent observers that the enlarged cardiac dullness of pregnancy is due to displacement of the heart (Gerhardt), and that there is no increase in the weight of the organ (Löhlein). Larcher (*Arch. gén. de méd.*, 1859, Vol. I., p. 291), declared that the heart became hypertrophied during pregnancy. This view has been largely held by the French writers, and opposed by the Germans following Gerhardt (*De Situ et Magnitudine Cordis Gravid.*, Jena, 1862). The opposition has recently received confirmation through the work of Stengel and Stanton (*Univ. of Penn. Med. Bull.*, Sept., 1904). These investigators made a clinical study of the heart and circulation during and after pregnancy, embracing physical examinations before and after labor, with determinations of blood pressure. Their report includes thirty-nine primiparæ, twenty-one multiparæ, and also ten complicated cases showing cardiac or renal disease antedating the pregnancy. The writers conclude that there is not, during pregnancy, any hypertrophy of the left ventricle or any special increase in its work. The increase of dullness to the left is due to the upward displacement of the diaphragm and the consequent displacement of the heart in an upward and outward direction. However, they were convinced that there is probably, during the later months of pregnancy, some continuous dilatation of the right ventricle, though this is apparently of very moderate degree. This they ascribe to the upward displacement of the diaphragm and pressure upon the lungs, increasing the difficulties of the pulmonary circulation. It is interesting to note that they were unable to find any material increase in the blood pressure before

or after labor. A notable increase was observed only at the time of labor; this they declared could be explained by the holding of the breath, the expulsive efforts, etc.

During parturition, great demands are made upon the heart. The blood is said to be increased during pregnancy, especially in its watery and fibrin making elements. The erythrocytes, though relatively diminished, are actually increased. The leucocytes are increased both absolutely and relatively. With the termination of labor, the blood pressure becomes diminished to such a degree that the heart may almost empty itself with each beat. During the puerperium, the blood is reduced in both quantity and quality.

Digestive System.—In tuberculosis, one of the most important systems is that which has to do with alimentation. Indeed, the prognosis of tuberculosis depends largely upon the condition of the stomach. There is usually more or less disturbance of the digestive tract during pregnancy. Nausea and vomiting are so common, especially from the sixth week to the third month, as to be recognized even by the laity as of diagnostic value. In the presence of tuberculosis, the persistent vomiting of pregnancy is especially pernicious. Constipation may be regarded as the rule in women, and it usually increases during pregnancy and the puerperium.

Urinary System.—Frequently the urine is increased somewhat in quantity, and often it has a slightly lower specific gravity. In the presence of a lesion of the kidney, pregnancy is especially deleterious, since tuberculosis adds to the poisons that are eliminated through the urine.

Nervous System.—Changes in the nervous system during pregnancy are often marked, especially alterations in disposition, perversions of appetite, and neuralgias, particularly of the face and teeth. The changes in disposition are usually in the direction of melancholia.

2. PATHOLOGY OF TUBERCULOSIS.

For clinical purposes, it is more practicable to consider the pathological changes as they are manifested by the *symptoms and physical signs of tuberculosis.*

Most cases of tuberculosis begin with bronchitis, manifested by cough, at first dry and hacking, occurring especially in the morning and evening upon changing the posture. The expectoration, at first absent, becomes abundant; it is at first mucoid, later mucopurulent, and possibly contains blood. Hemoptysis usually means

tuberculosis. Microscopic examination of the sputum reveals the presence of the bacillus tuberculosis, and later of elastic tissue.

Frequently the first symptom noticed is dyspepsia, often associated with anemia, chlorosis, amenorrhea, and general degradation of health. These are regarded as symptoms of toxemia. Only too often the onset is so insidious as not to cause the patient to seek medical advice until the disease is far advanced. It is these cases that the obstetrician may frequently discover, if he takes the trouble to make a careful search for the disease when he makes the obstetrical examination.

One of the early symptoms is shortness of breath upon exertion. Later there is dyspnea due to cardiac weakness, sometimes associated with cyanosis. Pain in the chest is a common symptom, which may be caused by pleurisy, or by intercostal neuralgia due to toxemia.

The temperature at first may be normal or subnormal in the morning, but shows early a rise at some time during the day, usually in the afternoon. With the fever there may be night-sweats. Later the temperature becomes higher, 103° F., possibly 104° F., with daily remissions of two or three degrees. After secondary infection by pyogenic microorganisms, constituting the period of "hectic," the temperature varies from 103° to 105° F, in the evening, and is normal or subnormal in the morning, constituting the "streptococcus curve." The night-sweats may be exhausting. The pulse at first corresponding to the temperature, with increased weakness becomes rapid, compressible, and finally influenced by exercise.

Frequently one of the earliest symptoms of tuberculosis is loss of weight, and in the later stages emaciation is so marked as to have been one of the first recognized signs of the disease. Hence the terms phthisis and consumption (wasting).

Laryngeal tuberculosis is usually secondary to pulmonary tuberculosis; but the disease may be primary in the larynx. In laryngeal tuberculosis, the voice becomes altered, weak, sometimes aphonic, and its use requires great effort. There may be an involuntary change from a low tone to a falsetto note, which may be maintained for a short time (Moure). The emaciation caused by the pulmonary tuberculosis, which usually precedes the affection of the larynx, is increased, and the expression of the patient becomes anxious. With extension of the disease, deglutition becomes difficult and painful. Destruction of the epiglottis may permit food to enter the larynx.

Etiology.—In tuberculosis, the specific etiological factor is the bacillus tuberculosis. Later, usually with the breaking down of tissue, there occurs secondary infection by the pyogenic micro-organisms, notably the streptococcus.

Among the factors predisposing the individual to infection, environment—exposure to infection—is the most important. The patient should be protected from further infection by tubercle bacilli, and also from the possibility of secondary infection by the ordinary pus-formers. Unhygienic surroundings, especially crowding, exclusion of fresh air and sunlight, a sedentary life, and exposure to dust, render the individual more liable to infection. Certain diseases, especially bronchitis, measles, whooping-cough, influenza, diabetes, chronic nephritis, cirrhosis of the liver, chronic heart disease, arteriosclerosis, aneurism of the aorta, and possibly above all trauma, prepare the body for infection by the tubercle bacillus.

The subject of heredity is interesting and very complex. The remote possibility of tubercle bacilli being transmitted through the spermatozoa or the ovum, has been proven and disproven many times. It is doubtful whether any predisposition or immunity is carried by the sperm or ovum.

Placental infection is another matter. The passage of toxines and bacteria through the placental circulation is pretty generally accepted as a possibility. Thus, the transmission of tubercle bacilli through the placenta has been reported by Schmorl and Runge. The younger the child at the time of infection, and the greater the infection of the mother, the greater is the possibility of infection through the placenta. An important etiological rôle has been ascribed to the direct transmission of the bacilli from mother to child, by some observers, notably Birch-Hirschfeld and his pupils. In support of this view, Schmorl and Geipel (*Münch. med. Woch.*, li., No. 38), have reported the examination of twenty placentæ obtained from tuberculous patients. Schmorl assumes that the fetus is tuberculous whenever tubercle bacilli invade the placenta, which finds some justification in the view that the placenta is essentially a fetal organ. Of the placentæ examined, eleven were from far advanced cases of pulmonary tuberculosis; four were from moderate cases, and three were from patients in the early stage; one was from a case of miliary tuberculosis, and one from a case of tuberculous meningitis. Two of the cases were delivered at the seventh and eighth months, respectively, the seventh-month placenta being reported tuberculous. In the

remaining eighteen cases delivery occurred at or near term, and eight of the placentæ were reported tuberculous. Of the nine tuberculous placentæ reported, five were from far advanced cases of pulmonary tuberculosis, one from a moderate case, one from an early case, one from a case of acute miliary tuberculosis, and one from a case of tuberculous meningitis. In only three of the cases could the diagnosis be made macroscopically; in the others a microscopic examination was necessary, and in some instances as many as two thousand sections were examined.

In considering this report, we must remember that these observations have not been confirmed, and that only ten cases of placental tuberculosis have been previously reported. It should be unnecessary to call attention to the possibility of confusing the tubercle bacillus with the smegma bacillus, and the likelihood of tubercle bacilli being conveyed from the tuberculous patient or some outside source to the placenta at the time of delivery or later, in other ways than through the blood. It is as difficult to understand why the intrauterine transmission of tuberculosis should lead so often to infection of the lungs, as some observers contend, as it is to understand how pulmonary tuberculosis may result in placental infection, in the absence of tubercular infection of the uterus or miliary tuberculosis. Such a method of transmission is almost inconceivable.

We can more readily accept the possibility of the passage of the products of the tubercle bacillus, through the fetal circulation. Cases have been reported in which the death of the child immediately after birth seemed to be due to the passage of toxins through the placenta. In the experience of the essayist, such cases are not uncommon. Fortunately, the immune substances seem to pass to the fetus more readily than the toxines or bacilli, so that the embryonal tissues have been credited with increased resistance to the tubercle bacillus.

The question of the milk transmission of tuberculosis is interesting. Koch has called into question the relationship between human and bovine tuberculosis. Some observers have sought to settle the question by showing that cattle may be infected by human tuberculosis, and that man may possibly receive infection from bovine tuberculosis. These experiments have only shown an apparent relation between the two infections, and that they are probably not identical. However that may be, numerous reports have been made of the finding of tubercle bacillli in the milk of both tuberculous women and cattle. In such examinations, the

tubercle bacillus must be differentiated from other acid-fast bacilli, which are so common in milk and butter. Neglect of this precaution may account for some of the reports that have been made. It is probable that milk becomes infected by the tubercle bacillus most frequently through careless handling by tuberculous individuals, the tubercle bacilli being carried by the hands in the same manner that lichen tubercles are frequently produced by scratching with infected nails. Of course, the ingestion of milk or any food containing living tubercle bacilli may lead to tuberculosis, more especially of the digestive tract. It is well known that Behring lays stress upon the milk transmission of tuberculosis. Indeed, a number of observers hold to this explanation of tuberculosis in adults, claiming that tubercle bacilli may become active after remaining latent in the body for years, as was held by Baumgarten to explain the possibility of inheritance of the germ in the presence of so few cases of congenital tuberculosis. It is possible that pulmonary tuberculosis may result from infection of the tonsils and pharynx, through the cervical lymph glands, as is held by M. Wassermann (*Berl. klin. Woch.,* Nov. 28, 1904). This investigator believes that the infection travels down the lymphatics to the pleura, and sets up a local pleurisy, which causes adhesions and enables the bacilli to enter the lung. We may readily conceive of a more direct route of infection, through respiration.

At any rate, with our present knowledge concerning the etiology of tuberculosis, it is not wise to permit tuberculous women to nurse their children. The chief danger from nursing is that of infection through the sputum of the mother, the tubercle bacilli being transmitted either through coughing, the immediate environment of tuberculous patients usually being infected with tubercle bacilli when these are being discharged through the sputum; or through contamination of the breasts by dirty hands. Besides, it is far from esthetic to derive a food supply, especially for helpless little children, from sick nurses or cows. Not only is there the possibility that such milk may contain tubercle bacilli, but it usually contains poisons produced by the growth of the tubercle bacillus.

Genital Tuberculosis.—P. Baumgarten (*Berl. klin. Woch.,* Oct, 17, 1904), has reported the results of experiments upon fifty rabbits, made with the bacillus of bovine tuberculosis, to determine the progression of tuberculous infection in the female genital tract. In general, it was found that the tuberculous infection traveled with the natural currents and was limited to the system in which it began. Thus, tuberculous infection of the vagina, uterus and

tubes traveled downward and never toward the distal ends of the tubes. Infection of the genitalia did not tend toward infection of the urinary tract, nor did urinary infection frequently involve the genitalia. Infection of the urinary tract usually traveled with the urinary current. Tuberculosis of the peritoneum did not lead to infection of the genital system, a fact which Baumgarten ascribes to a sealing of the tubes by an early inflammation. In all the cases, the infection spread through the lymph glands and vessels, to cause a generalized tuberculosis. It must, however, be remembered that these were experiments with bovine tuberculosis in rabbits, which may differ from the infection of women with human tuberculosis.

Physical Signs.—In tuberculosis, the physical signs are at first entirely absent. Inspection later may reveal the characteristic long, narrow chest, and the winged scapulæ, which have been aptly compared to folding doors or the wings of the eagle. The clavicles become prominent. The habitus phthisicus, marked by a long, flat chest, with emaciation and weakness, formerly believed to predispose to tuberculosis, is now recognized as evidence of the existence of the disease.

In the presence of tuberculosis, palpation early shows lessened mobility of the chest, with defective expansion on one or both sides. With consolidation, vocal fremitus is increased. In cases of pleural exudate, the vocal fremitus is diminished or absent. Percussion may reveal defective resonance, especially in the region of the clavicle. In advanced cases, percussion will show dullness from consolidation, the so-called fibroid change; or a cracked-pot sound may be caused by the presence of cavities. Auscultation, as a rule, shows prolonged expiration early in the course of the disease. Later, all sorts of râles may be heard. A very important point is the early accentuation of the second pulmonary valve sound.

3. TUBERCULOSIS OCCURRING DURING PREGNANCY.

The too prevalent custom of pregnant women going into seclusion increases the likelihood of tubercular infection, through prolonged confinement in the vitiated atmosphere of contaminated dwellings, often in close association with infected individuals; and at the same time such retirement reduces the resistance or immunity to tuberculosis, largely through lack of exercise in the open air and sunlight. Cornet states that whether pregnancy has an influence on the development of pulmonary tuberculosis has not been ascertained, but the occurrence of renal tuberculosis

has been attributed to it, and similarly a tuberculosis of the mammary gland during lactation. Fellner (Ottfried O. Fellner, *Wiener med. Woch.*, 1904, s. 1158), claims to adduce facts that show that tuberculosis frequently occurs during pregnancy, and even more frequently relapses or recurs. In discussing acute general miliary tuberculosis, Cornet states that the uncontrollable vomiting of pregnancy may usher in an acute miliary tuberculosis, of which dyspnea going on to fatal asphyxia may be the only symptom. He adds that excessively rapid loss of weight under certain circumstances may determine the diagnosis.

Fellner, repeating the experiment of Alfred Wolff, found that inoculation with ordinarily fatal doses of vibriones resulted in the rapid breaking down of the vibriones. This would seem to suggest the possibility that there may be an increased resistance to the tubercle bacillus during pregnancy. However, were this true, it would be discounted by the increased predisposition during the puerperium. Pregnancy does not markedly diminish the predisposition to tuberculosis. Statistics indicate that pregnancy renders the mother more susceptible to tuberculosis. In the cases studied by Fellner, there were 140 cases of relapse or recurrence of tuberculosis in pregnancy, and 65 new cases. The severity of these cases is emphasized by the statement that almost one-half of them had hemorrhages. The preference of laryngeal tuberculosis for the pregnant and puerperal woman has been remarked.

Effect of Tuberculosis on Pregnancy.—Usually tuberculosis does not interrupt pregnancy. It is not uncommon for a far advanced case of phthisis to be delivered at term, the child dying in a few days and the mother in a few days or weeks.

4. PREGNANCY OCCURRING IN THE TUBERCULOUS.

Tuberculous women frequently become pregnant. Indeed, tuberculosis seems to predispose to pregnancy, apparently in an attempt on the part of nature to perpetuate the species. As a rule the pregnancies are normal. In cases that are far advanced, after secondary infection by pyogenic microorganisms has caused pulmonary sepsis, sterility and abortion may occur just as in other cachexiæ; but my experience has been that tuberculous patients are not prone to abortion or miscarriage.

5. PROGNOSIS.

Tuberculosis is a dangerous disease, and the gravity of the infection is increased by pregnancy, chiefly through the deleterious

influence of parturition and the puerperium. Fellner found the maternal mortality high in tuberculosis (9 to 10 per cent.), while in laryngeal tuberculosis it reached the enormous figure of 44 per cent. The infant mortality is great. Thus, of 289 children reported by Fellner, 24 per cent. were dead at birth or died shortly afterwards. Longer observation of such cases led Silberman to place the mortality at 28 per cent., and Dirner at 37.5 per cent.

The tuberculous lung cannot functionate as well as an organ that is not diseased. Such a lung may not respond properly to the demands of pregnancy and especially of parturition. The heart also is seriously strained to aerate the blood through the diseased lung. It would seem that the danger of hemorrhage would be increased, but such has not been my experience.

Osler attributes to Dubois the observation that "if a woman threatened with phthisis marries, she may bear the first accouchement well; a second with difficulty; a third never." However, most of the maternal deaths occur after the first child.

6. TREATMENT AND PROPHYLAXIS.

The occurrence of pregnancy should not deter us from treating tuberculosis. Nor should we be negligent regarding prophylaxis in cases of pregnancy. Only too often the pregnant woman confines herself within apartments that are unhygienic, not infrequently in close association with tuberculous cases. There is danger of infection in such cases regardless of what may be said as to the natural immunity or susceptibility in pregnancy. Pregnant women should be protected from tuberculosis as well as from other infectious diseases.

Much attention has been paid to the dissemination of infectious diseases by insects. In the spread of tuberculosis, the common house fly apparently plays an important part. The evident craving of flies for tuberculous sputum is a matter of common observation. In this connection some interesting work has been done by Frederick T. Lord (*Boston Med. and Sur. Jour.*, Dec. 15, 1904). This investigator found that after the ingestion of tuberculous sputum by flies, tubercle bacilli are excreted within eighteen hours, which remain virulent for at least fifteen days. Furthermore, the bacilli actually multiply in the intestinal canal, apparently without otherwise affecting the fly, so that these pests act as veritable incubators. It seems needless to add that tuberculous patients and infected sputum should be protected from flies; and as a matter of esthetics and hygiene, these insects should be kept away from food stuffs.

Should the tuberculous woman be protected against the possibility of pregnancy? It is pretty generally recognized that the tuberculous woman should not become pregnant. In the case of a married woman, this fact should be impressed upon the husband. In those cases, fortunately rare, in which a woman, who is a desirable member of society, is united to an inconsiderate husband, it might be necessary to consider means of preventing conception, the best and most satisfactory of which would be a dissolution of the union.

The treatment of pregnancy in the tuberculous should be begun at the earliest possible moment. Tuberculosis increases the importance of placing the pregnant woman under hygienic surroundings. The habit, too prevalent among pregnant women, of going into retirement, should not be tolerated if such retirement is to mean confinement in unhygienic surroundings, exclusion of pure air and sunlight, and exposure to various infections including tuberculosis and the septic infections.

In the treatment of tuberculosis, I have found that pregnant women bear tuberculin remarkably well. We must remember, of course, that tuberculin addresses only the infection by the tubercle bacillus, and cannot be expected to have a specific influence upon the "hectic" of advanced cases, which is due to pulmonary sepsis. We cannot enter fully into the treatment of tuberculosis, but we should emphasize the importance of the open air treatment, to which pregnancy is no contraindication. Creosote, usually best in the form of the carbonate, may be used if there is mixed infection, notwithstanding the possibility that it may cause abortion.

In tuberculosis there are produced within the body certain poisons, products of the tubercle bacillus and the secondary infections, which are eliminated largely through the emunctories. Hence, the importance of securing free elimination by the proper treatment of constipation and care of the kidneys and skin. The patient should be protected from exposure to cold and wet, and especially from drafts.

The diet is important. Here the judgment of the physician is often taxed. Suralimentation, particularly the excessive use of meat, so important in the treatment of tuberculosis, may do harm in pregnancy, especially if there is any weakness or disease of the kidneys. The appetite in pregnancy is often ravenous or deficient, and is not a safe guide.

Exercise should not be neglected. Methodical exercise, preferably in the open air, is of great value, but should not be carried to

the point of fatigue. Here, as in all our treatment, our advice must be adapted to the requirements of the patient.

The vomiting of pregnancy, if excessive, is especially pernicious in tuberculosis, and should not be permitted to progress too far before resorting to an interruption of the pregnancy. Here, again, the greatest judgment must be exercised.

In general, it may be stated, that if an artificial abortion is required by any other condition, the presence of tuberculosis would not militate against such an operation.

Interruption of pregnancy, in order to save the life of the mother, was recommended by Bourgeois as early as the sixteenth century. Opposition to this view has increased until many workers, including Pinard, Ahlfeld, and Veit, have gone so far as to declare that pregnancy ought never to be interrupted in tubercular cases. This question is not infrequently solved by nature through a spontaneous interruption of pregnancy. Such a termination was observed by Fellner in from 71 to 90 per cent. of cases.

Veit would not interrupt pregnancy in tuberculosis as long as the mother shows an increase in weight such as normally should occur during pregnancy. Asch very pertinently observes that a mere increase in weight does not necessarily indicate permanent improvement. Indeed, it would seem better to rely upon the general clinical picture, including the increase in weight, rather than upon the weight alone, in determining the actual condition of the patient. The greatest danger is not during pregnancy but during the puerperium. At any rate, the desirability of the artificial interruption of pregnancy must be regarded as extremely problematic in these cases, especially when the objective symptoms do not show that the tuberculosis is progressing.

When the tuberculosis is progressing in a pregnant woman, the interruption may not suffice to check the tubercular process, and the physician may be blamed by the laity for the death of both the mother and child. Of course, the danger of unjust criticism should not deter us from doing what we believe to be our duty; but it is a serious matter to take life.

In a general way it may be said, that when interruption of pregnancy is indicated, the earlier it is accomplished the safer. Thus, abortion in the third or fourth month may be accomplished with but slight danger to the mother, whereas the interruption of pregnancy that has progressed to the second half entails considerable danger, both from the labor and the puerperium. It has been urged that the frequent production of abortion in tuberculous

patients would subject them to greater risk than would be incurred by permitting the pregnancies to terminate normally. In such cases the question arises as to the advisability of preventing conception. Total abstinence is the best preventative.

Mild cases of tuberculosis usually go through pregnancy unscathed. When such cases become suddenly progressively worse during pregnancy, the advisability of the interruption of pregnancy requires careful consideration. In laryngeal tuberculosis, the pregnancy should be interrupted early or not at all. Fellner found that the mother does not survive interruption, in such cases, as late as the fifth month of pregnancy.

The interruption of pregnancy, in Shauta's clinic, was found to be best accomplished by tamponage with iodoform gauze in the early months, and by the insertion of a bougie in the later months of gestation.

7. ADVICE TO TUBERCULOUS PATIENTS REGARDING MARRIAGE, NURSING, ETC.

Not infrequently it is the duty of the physician to give advice concerning the most intimate personal and family matters, such as the sexual relation, marriage, conception, etc.

The value of rest in the treatment of tuberculosis is generally recognized. Rest of mind and body is commonly advised. At times it becomes necessary to inform a tuberculous patient that this rest should be extended to the organs of reproduction. The point of over-indulgence in sexual pleasures is soon reached in tuberculosis. It is a good general rule for both sexes not to worship at the shrine of Venus too ardently, and never to the point of fatigue. The mind should be diverted from erotic contemplations; the indulgence of the sexual appetite should not correspond to the sexual gluttony so common in tuberculosis. We cannot accept the statement of one writer, that "Pregnancy, coition, etc., are particularly desired by women affected with phthisis, which constitutes a pointing of nature towards a remedy for the evils by which the system has been invaded." Tuberculosis is not an exception to the general rule, that moderation or even abstinence is advisable in those cases in which the appetite shows an abnormal craving. Dyspepsia furnishes a reasonable analogy. Cornet has put the matter well in the statement, that "in sexual matters the consumptive must observe absolute abstinence as long as the process continues to progress. With the return of strength and well-being, however, a strict compliance with this demand be-

comes irksome to the patient, and it is best, then, to permit indulgence within definite limits."

Sexual intercourse should be interdicted in the case of individuals of either sex suffering from genitourinary tuberculosis. The danger of pulmonary tuberculosis being caused in this way is far less than the danger of tuberculosis of the genitourinary organs being acquired through such intercourse. Eichhorst declares that "sexual intercourse with women suffering from tuberculosis of the urinary or generative organs, is not unattended with danger for healthy men, because tubercle bacilli are readily capable of entering the urethra, whence they may be further disseminated, and, among other organs, reach the lungs." Such an origin of pulmonary tuberculosis almost requires a stretch of the imagination, especially in view of the frequent opportunity afforded for infection in more direct ways. One could more readily think of genitourinary tuberculosis being caused by pulmonary tuberculosis, through uncleanly habits.

To marry or not to marry, is a question frequently asked, and too frequently not asked. Only too often the question of marrying is decided in the affirmative without consulting the physician. Nor is the advice of the physician in this regard always followed. Nevertheless, our advice concerning this matter, when requested, must be conscientiously given.

As a rule it is not desirable for the tuberculous to marry. But there are exceptions to this rule. For instance, in cases that are cured, or that have remained apparently cured for two years or longer, the individuals should not be deterred from marrying. In general, the medical advice regarding marriage should be based upon the physical condition of the patient and any change in environment that may follow the assumption of the marital relation. Not infrequently greater harm will be done by breaking an agreement than by permitting marriage, especially if the patient is of a nervous type and the tuberculosis latent or not far advanced. We must not forget that in the absence of conception and excessive sexual indulgence, the prognosis of tuberculosis in the married is practically the same as in the unmarried. But the tuberculous woman should not become pregnant, and this fact should be impressed upon the husband. Unfortunately good intentions along this line are not always carried out.

The effect of pregnancy on tuberculosis has frequently been discussed from the standpoint of the plethora of pregnancy and the asthenia of tuberculosis. Thus, one writer claimed that the regular

profession should recognize that *contraria contrariis curantur,* in opposition to the belief of many irregulars, who call themselves "homeopathists," that *similia similibus curantur.* Such reasoning at the present day seems childish.

Laryngeal tuberculosis is an absolute contraindication to marriage, in a medical sense, *i.e.* the possibility of conception.

In cases of lymphatic or bone tuberculosis, that have apparently recovered from the disease, the individuals may be permitted to marry, notwithstanding that in such families tuberculous infections frequently occur.

In cured or apparently cured pulmonary tuberculosis, the privilege of marriage should not be denied. However, sight should not be lost of the fact that latent tuberculosis may be aroused by pregnancy.

The marriage of tuberculous patients is not without danger, both for males and females, and both for the patient and the healthy party. It has been questioned whether we should advise against marriage unless one of the parties is healthy. One writer has held that "When we turn to the subject of children, we as physicians have no right to anticipate Providence." With this statement I cannot agree. However, when both parties are tuberculous, we should advise against conception, if we believe conception would endanger the life of the mother.

Tuberculous mothers should not nurse their offspring, nor should tuberculous women ever act as wet-nurses. This advice must be given not only for the benefit of the child, which should be protected from infection and poisoning by the toxic products of the tuberculous and septic infections as far as possible, but also for the sake of the mother, whose resistance to the disease would be lessened by the drain of nursing.

Some writers advise permitting the child to nurse. Thus, Schlossmann declares that tuberculosis is not a universal unconditional countraindication to nursing, and states that he has repeatedly allowed women to nurse their children without any deleterious influence on the women. He declares the influence on the mothers to be altogether beneficial, as they gain in weight and in all ways improve more rapidly than otherwise. He was not able to find the tubercle bacillus in the milk of four cases examined. However, other investigators, such as Escherich, Robinovitsch, and Kempner have done so. It is not clear that the tubercle bacilli found in the milk came from the mother's breast. It would appear more probable that they found access to the milk through acci-

dental contamination of the breasts. But that fact would not lessen the danger of infection. Stress should be laid on the passage of toxines through the mother's milk. My own observation of cases would lead me to believe that these children receive a degree of protection, probably through the passage of immune substances through the mother's milk. The great danger in such cases is that the child may be infected from the mother's tuberculous sputum, which may be conveyed to the child by contaminated hands or through coughing or kissing. For this reason it is not advisable to permit the child to nurse from a mother or wet-nurse who is discharging tubercle bacilli. If protected from infection, by separation from tuberculous parents and tuberculous environment, the child usually remains free from the disease.

A case reported by A. Treutlein (*Münch. med. Woch.*, 1904, li, s. 1246), has been held to support Behring's theory of primary infantile intestinal tuberculosis. In the case cited, a calf showed tuberculosis of the mesenteric glands and of a loop of the intestine above the ileocecal valve. The mother gave a positive reaction to tuberculin. But the value of the report as a support of the Behring theory was destroyed by the fact that there was a tumor upon one of the teats that was probably tuberculous. Of course, no one would think of letting a child nurse from a tuberculous breast.

Tuberculosis is found in children much less frequently than in adults. Froebelius, in the post-mortem examination of 18,569 infants, found the cause of death to be tuberculosis in only 416 cases. Even when separated from tuberculous parents, a child may become infected from other sources, the same as a child of non-tuberculous parentage. When considering this subject, we must not forget that tubercular children may support their parents, and many cases of tuberculosis recover absolutely.

CONCLUSIONS.

1. Pregnancy affects all the important systems of the body. For practical purposes, gestation may be looked upon as a functional exercise of the female generative system, leading to characteristic changes in various other systems, similar to exercise of the muscular system causing changes in other parts of the body; parturition is a more or less violent exercise, and the pureperium may be regarded as (a) a period of recuperation from the shock of labor, and (b) a period of involution of many of the changes in the various systems evolved during gestation.

2. Tuberculosis is usually at first a pure infection by the tubercle

bacillus, but frequently the patients do not come to us until the disease is a true phthisis, a multiple infection, in which a pulmonary sepsis is superimposed upon a tuberculosis. The occurrence of secondary infection increases the virulence of the toxines and in every way makes the condition of the patient worse. Laryngeal tuberculosis and miliary tuberculosis are exceedingly grave forms of the disease.

3. Many writers have reported that tuberculosis is especially liable to occur during pregnancy. It is possible that this may be only apparent, the disease being more frequently aroused from a latent state, by pregnancy, or first recognized at this time. On the other hand, the seclusion of patients at the time of pregnancy may place them under conditions that predispose to tuberculosis, especially through close association with tuberculous patients.

4. The practice of pregnant women going into retirement should not be tolerated, if such seclusion predisposes to infection through unhygienic surroundings or association with tuberculous patients. The pregnant woman should be placed under good hygienic surroundings, protected as far as possible from the causes that predispose to tuberculosis. To this end it is advisable to recommend suitable exercise in the open air and sunlight. Pregnant women, especially if tuberculous, should be protected from conditions that predispose to secondary infection; they should avoid impure, vitiated atmosphere, and association with infected individuals, and those affected with influenza or the ordinary "colds," since these increase the virulence of the disease.

5. (a) The gravity of tuberculosis is increased by pregnancy, especially during the puerperium. (b) The highest maternal mortality has been observed by the essayist in primiparæ. (c) A tuberculous lung is necessarily a defective organ. (d) Hemoptysis does not occur with especial frequency at the time of parturition.

6. Tuberculous patients, when pregnant, should come under treatment early. They should receive instructions regarding hygiene, the care of the emunctories, diet, exercise, and protection from the predisposing causes of tuberculosis.

7. Pregnant women bear the tuberculin treatment remarkably well. The diet of the tuberculous, when pregnant, should be carefully suited to the requirements of the individual. Suralimentation, so valuable in tuberculosis, may be detrimental during pregnancy through the strain imposed upon the kidneys.

8. (a) The excessive vomiting of pregnancy requires especial

attention in tuberculosis. (b) Interruption of pregnancy is a serious matter, and usually is not beneficial so far as pulmonary tuberculosis is concerned. But tuberculosis is not a contraindication to this operation when required for other reasons. In laryngeal and miliary tuberculosis, the interruption of pregnancy should be practiced early or not at all.

9. (a) Tuberculosis seems to increase the sexual appetite and to actually predispose to pregnancy. (b) In the indulgence of the sexual appetite, tuberculous patients should be instructed to always stop short of the point of fatigue. (c) In genitourinary tuberculosis we should observe the axiom that a diseased member is best treated by rest.

10. (a) Marriage of the tuberculous is usually not desirable, but to this rule there are exceptions as noted in the paper. (b) Tuberculous women should not nurse children. A child may be infected by association with a tuberculous mother.

BIBLIOGRAPHY.

In addition to the citations in the paper, the following references are worthy of mention:

1. Ernst Horn, "Erfahrungen über die Natur und Behandlung der Phthisis puerperalis" (*Archiv für Med. Erfahrung,* Berlin, 1804, Bd. vi, 86-125).

This is an exceedingly interesting paper, notwithstanding it was written over a century ago. The writer, a medical editor, laid stress upon the fact that weakening periods in the puerperal state are often indicative of true consumption. Among the causes that predispose to phthisis in the puerperium and during pregnancy, he mentions: Weak digestion, incessant vomiting, diarrhea, poor or insufficient food, unpleasant disposition, and worry over the coming addition to the family. Two very important signs are: (1) The lochia, which should have stopped, still continues and resembles a chronic discharge. (2) The milk steadily becomes thinner and less in quantity. The child, hungry for nourishment, soon suffers from inanition. We notice an almost continuous fever, remittent in form, and chilly sensations of the whole or part of the body, which recur daily at irregular times. Toward noon or afternoon the fever sets in, and hardly leaves the patient the whole day. Toward evening and night it is most intense. Fear and thirst trouble the patient, and occasional sleep is frequently interrupted. A refreshing night is now seldom to be expected. Some patients are very irritable and sensitive. They feel their illness more than others would under similar circumstances. Their disposition is changeable, and usually unbearable. Their minds are possessed in turn by fear and hope. . . . If one talks to them and consoles and encourages them and gives a good prognosis, they

are glad and take new hope, and their sadness and gloom give place to happiness and quiet. Such a case is very serious. Often we notice expressions of indifference in the first months of the illness. This disappears as the fever, emaciation, etc., progress. These are the stout, strong and phlegmatic individuals. Horn states that he has observed that these fat, strong bodies progress more rapidly than others toward complete consumption. It is well to know that the chest pains, whether right or left or in the middle of the chest, do not always mean pus cavities in the lungs, or other disorganizations in the lungs.

The patients may want but little food, but they should be given much anyway. But here gentleness and care and encouragement may accomplish more than strict dictation. Referring to the lessening of the milk and its deterioration, Horn states that under these circumstances it is proper to advise the mother to wean the child. The poor and the middle class do not consent to this readily, but careful explanation will win the mother over. The nursing is a source of draining which does unlimited harm to the patient, and which harms the child more than it helps it. It has been truly observed that the consumptive mother gives to the child the origin of the illness. However, Horn continues: "It is hardly necessary to say that this has no reference to a so-called contagii phthisici, but that the insufficient and poor nourishment of the young and heretofore healthy baby, is not good and will be a cause of its death." One tries in every way to nourish the wasted body with easily digested, nourishing and stimulating food and drink. . . . Horn insisted particularly on the daily taking of animal nourishment. Tender meat, lean, not fat, and soup broths, that are easily digested, not containing fat. Eggs, preferably raw or soft boiled, belong in this class of foods. Soups with tea, spiced chocolate, wine and spices in coffee, soft boiled with butter, pepper or mustard, is the best way to give the yolk of egg. One of the best means of treatment is the warm bath, which cannot be recommended strongly enough.

Let the patient keep real warm, and in warm air, take light exercise, adapted to the physical condition, either on foot or driving. When the patient's condition will permit, the exercise should be taken in warm open air, or they may be carried out of doors. This often gives very good results. In the way of drugs, saturated solutions of aromatic plants are recommended, mixed with bitter tonics, which should be alternated so that the patient will not tire of the medicine, nor the organism become accustomed to the drug. Various decoctions of strengthening barks and roots are mentioned, such as quinine, sweet willow (laurel), pink root, etc., which are given with cinnamon water, peppermint water, Hoffman's anodyne, sulphuric ether, or alternated with essences and tinctures. It is interesting to note that the writer refers to the misuse of quinine in the hospitals at that time. Iceland moss is mentioned, but the writer gives the preference to the animal jellies (extracts). Iron preparations, especially those with wine,

wine spirits, and ether, are especially suited to cases in which there is not an abnormal sensibility of the body.

2. Succow, G. C. F., "Historia Phthiseos pulmonalis purulentæ in femina gravida ortæ et postpartum sponte sanatæ," Jena, 1822. The case reported appears to have been one in which a pus cavity was spontaneously emptied, and the improvement, which was coincident with pregnancy and the puerperium, was wrongly attributed by the writer to gestation. Succow declared "Hippocratis vero affertum: 'mulierem in utero gerentum capi ab aliquo morbo acuto letale est' non absque restrictione verum esse."

3. Hervieux, E., "De l'influence de la grossesse sur la marche sur la marche de la phthisie pulmonaire quel-ques mots sur la question de l'hérédité dans cette dernière maladie" (*Union méd.*, Paris, 1847, i, 38).

4. Robert A., "Influence de la grossesse sur la marche de la phthisie pulmonaire" (*Union méd.*, Paris, 1847, i, 140).

5. Grisolle, A., "De l'influence que la grossesse et la phthisie pulmonaire exercent réciproquement l'une sur l'autre" (*Arch. gén. de méd.*, Paris, 1850, 4.s., xxii, 41-52).

6. Dechambre, A., "Influence de la grossesses sur la marche de la phthisie pulmonaire" (*Gaz. méd. de Paris*, 1851, 3.s., vi, 639).

7. Tott, C. A., "Einfluss der Schwangerschaft und Entbindung auf den Verlust der Phthisis" (*N. Ztschr. f. Geburtsk.*, Berlin, 1851, xxx, 223-225).

8. Dubreuille, C., "Influence de la grossesse, de l'accouchement, et de l'allaitement, sur la développement et la marche de la phthisie pulmonaire" (*Rev. méd. franc. et etrang.*, Paris, 1851, ii, 649, 722; 1852, i, 23, 85. Also: *Ann. de méd. belg.*, Brux., 1852, i, 21, 366; ii, 98. Also: *Bull. Acad. de méd.*, Paris, 1851-2, xxii, 14-25).

9. Lassègue, P., "De l'influence de la grossesse et de l'état puerpéral sur la marche de la phthisie," Paris, 1856.

10. Warren, E., "The Influence of Pregnancy on the development of Tubercles," Philadelphia, 1851. This essay was granted the Fiske fund prize, and was also published under the following title: "Does Pregnancy Accelerate or Retard the Development of Tubercles of the Lungs in Persons Predisposed to This Disease?" (*Amer. Jour. Med. Sciences*, Phila., 1857, n.s., xxxiv, 87-118.) If it is remembered that those formerly regarded as predisposed to tuberculosis, are now known to already have the disease in an early stage, it will be apparent how pertinent is that paper to the subject we are considering. By argument and the citation of numerous authorities and statistics, the writer sought to prove: "(1) There is an inequality in the relations which men and women sustain to phthisis; the former being less liable to it than the latter. (2) This inequality depends upon certain differences of conformation, etc., which are plain, palpable and conspicuous. (3) An examination of phthisical statistics should show that more women fall victims than men, and that the difference in the relative mortality of the two is as plain, palpable and conspicuous

as their original dissimilarity of constitution and predisposition. (4) An examination of statistics proves that it is not a settled fact that more females are destroyed by this malady, and that there is a positive approximation towards equality in the effects of phthisis upon the two sexes. (5) This 'approximation towards equality' shows the operation of some great equalizing cause, by which a certain amount of protection is secured to the female system, that makes up for its greater original susceptibility and affects the general result in the manner alluded to above. (6) Pregnancy complies with all the conditions which this cause demands for its operation, and it is fair to attribute this protecting, preventing and equalizing effect to its influence upon the female system."

Much of the article does not conform with the ideas of to-day. It would be interesting to know whether the premises of the author would hold, in view of the known fact that the statistics are gathered largely from hospitals, where a comparatively large percentage of men are treated. At any rate, the conclusions of the author are interesting, especially in that they agree with the common observation that tubercular cases usually show apparent improvement during pregnancy. Unfortunately, this is much more than counterbalanced by the aggravation of the tuberculosis by parturition and the puerperium.

11. Coillot, A., "De l'influence de la grossesse et de l'état puerpéral sur la marche de la phthisie pulmonaire," Paris, 1858.

12. Thomas, T. G., "Phthisis Proving Fatal During Pregnancy" (*New York Jour. Med.,* 1859, 3.s., xii, 238). Death from phthisis secured in the eighth month of pregnancy, the kidneys post-mortem showing the second stage of Bright's disease. The case was presented as a clinical report before the New York Medican Union, September, 1859. The reporter laid stress upon the observation that "A direct current is transmissed from the vessels of the uterus to the placenta. Air and water could be forced from the uterine sinuses to the sinues of the placenta."

The conclusions of this essayist are: "1. Pregnancy and lactation are occasionally important causes of phthisis. 2. Phthisical women become less easily pregnant than do others. 3. Pregnancy cannot suspend phthisis; on the contrary, it hastens its progress. 4. Labor and the puerperal state have only a depressing influence upon women that are exhausted and that have arrived at the third stage of tuberculosis. For those that have not passed the second stage, labor is a favorable circumstance. 5. Pregnancy and labor are not apparently influenced by phthisis." The writer criticises severely those who advise pregnancy as a means of suspending phthisis or as a curative agent. Phthisical mothers should be prohibited from nursing, both for their own interest and for the welfare of the child.

13. Balmaud, J., "De l'influence de la grossesse et de l'accouchement sur le développement et la marche de la phthisie pulmonaire," Paris, 1863.

14. Dutcher, A. P., "Pregnancy; Its Influence on the Development and Progress of Pulmonary Tuberculosis" (*Cin. Lancet and Observer,* 1863, vi, 20-25).

15. Pagull, J. V., "Essai sur les rapports reciproques de la grossesse et de la phthisie," 1865.

16. Caresme, A. A., "Recherches cliniques relatives à l'influence de la grossesses sur la phthisie pulmonaire," Paris, 1866. The examination of phthisical women, who are or have been pregnant, reveals that: 1. In two-thirds of the cases, pregnancy plays a great part in the development of this disease. 2. In by far the greater number of cases, pregnancy renders the tubercular symptoms apparent, either during the course of gestation or shortly after its termination. 3. The period when these symptoms become apparent varies greatly, without apparent reason. When they appear during the course of gestation, they usually occur during the middle or second half. 4. When the pulmonary affection existed before the pregnancy, the latter produced an exacerbation of the tuberculosis six out of seven times before delivery and only one time afterwards. 5. Gestation is active in the development of tuberculosis only among some subjects, in whom there is an hereditary predisposition, indicated by family antecedents, by temperament or by the manifestations of the diathesis. 6. This action has determined, long before the advent of phthisis, some premontory symptoms of chlorosis, which, having appeared during or after pregnancy, have persisted up to the explosion of the first thoracic symptoms. 7. Gestation has not affected the lung directly, but it has influenced the entire organism, which it has debilitated and prepared even to diathetic manifestations. 8. Pregnancy has sufficed in a certain number of cases to produce, of its own accord, tuberculosis in some subjects predisposed to it by heredity; but more often (about two times out of every three) its influence has been assisted by other causes of enfeeblement. 9. Among these causes the most powerful and the most frequent has been bad hygiene. 10. Various other diseases are, in general, much less important than hygienic conditions. It is, however, necessary to except thoracic or scrofulous affections, which, without the same gravity, always indicate a disposition unfavorable to both the lung and the organism. 11. It is necessary to except also the complications of gestation and of the puerperal state, which in a third of the cases have added considerably in the development of tuberculosis. 12. Strength of constitution has not prevented this development. 13. No period of adult life has been especially favorable for this development of tuberculosis. 14. Confinement occurring in the course of tuberculosis has rarely produced lasting amelioration. Almost constantly the condition has remained stationary or has grown worse after delivery. 15. Multiparity, two out of three times, has acted like uniparity; it is the last gestation only that has altered the condition of health. 16. Premature delivery has not notably modified the action of pregnancy. 17. Lactation has acted in the same way that pregnancy does in debilitating the organism,

but only when it has been greatly prolonged or complicated. 18. When gestation has not played even a sensible part in tuberculization, there are other debilitating causes, besides bad hygiene and some febrile or inflammatory affections which, together with the congenital predisposition, have determined the development of the disease.

17. Desouiller, A., "Essai sur l'influence de la grossesse et de l'allaitement sur la phthisie pulmonaire," Paris, 1866. The ancient authors, who first busied themselves with the influence of pregnancy upon tuberculosis, were: Cullen, Borden, Joseph Franck, Dugès, Antoine Portal and many others. They professed that pregnancy often retards phthisis, and that it is only commonly after confinement that the symptoms return with violence and cause death in a short time. Baumès, in a work which he published on pulmonary phthisis and which was crowned by the Society of Medicine on the 11th of March, 1783, did not hesitate to express the same opinion. One of his contemporaries, Rozières of Chassagne, wrote in his manual of pulmonary diseases, that of two women phthisical to the same degree, one can be sure that the one that would become pregnant would carry her child to full term, and that the other would die before that time. Finally Briende and Antoine Petit do not hesitate to declare that pregnancy has a tendency to moderate the progress of pulmonary phthisis. Bayle and Laennec preserve a silence upon this question, and it is necessary to come as far as M. Andral to find the first dissension upon this question. M. Andral writes in the first two editions of his Clinique Médicale, as follows: "It has been said that under the influence of pregnancy, pulmonary tuberculosis has generally become stationary. This fact, which we are far from denying, cannot be made to agree with that which we have observed among nine women who were pregnant and who were manifestly phthisical. In five of these cases the pulmonary affection does not seem to us to have been modified either for the better or for the worse by the state of pregnancy. In the other four cases, the phthisis, which was only very little advanced at the time when the first signs of pregnancy manifested themselves, arrived at its last stage during the course of the pregnancy. Two of these women succumbed before delivery, and the two others shortly afterwards." In the last edition of his Clinique, M. Andral was brought by a new series of cases to an opinion altogether contrary to fact, and he published anew that the symptoms of phthisis are suspended or at least remain stationary during the course of pregnancy. After M. Andral comes M. Louis, in 1843, with the second edition of his Researches on Phthisis. This wise physician did not possess sufficient evidence to solve the question.

18. Mattei (*Courrier méd.*, Paris, 1868, xviii, 18), "Multipare: influence des grossesses sur la tuberculisation pulmonaire les moyens hygiéniques pour la tuberculose sont encore plus efficaces que les moyens thérapeutiques; boute du climat de la Corsa; les tubercules pulmonaires loin d'affaiblir la fécondité semblant

Paccroitre, hémoptysie aux époques cataméniales pendant la grossesse; la douleur des varices alternant avec les douleurs thoraciques; effet des preparations iodées sur la toux des femmes grosses; accouchement heureux pour la mère et pour l'enfant; phthisie déclarée et mort de la femme un an après les couches; les signes rationnels en disent souvent plus que les physiques pour la diagnostique de cette maladie à son début."

19. Zollitsch, M., "Ueber Complication von Lungentuberkulose mit Schwangerschaft," München, 1868.

20. Stone, Alex J.: "Details of a case bearing upon the question of the influence of pregnancy upon tuberculosis" (*New York Med. Jour.,* xiv, 507). *A case* is recorded in which the tuberculosis apparently began at the time of impregnation. The report reflects a common experience, in that the patient was delivered July 9th, the child died July 22d, and the mother on August 9th. From an incomplete examination of the literature up to that time, 1871, Stone could find but two, M. Dreuihl and M. Grisolle, who rejected the belief that pregnancy is unfavorable to the deposit of tubercle, "the authorities accepting the theory of antagonism between pregnancy and tuberculosis being too numerous to quote."

21. Ortega, J.: "De l'influence qu'exercent la grossesse, l'accouchement et l'allaitement sur la phthisie pulmonaire et réciproquement" (*Thèse de Paris,* 1876).

Out of 95 women, in whom pulmonary tuberculosis was declared to exist, either before, during, or after gestation, 30 presented some hereditary tubercular antecedents, 44 did not and in 21 cases there was no information with regard to heredity. Thirteen women in whom the disease appeared during or after pregnancy, became pregnant again, some once, others twice, rarely three times, and then, as a rule, the pregnancy did not arrive at full term. If there was at times some improvement during gestation, the disease almost always made rapid progress after confinement. The women reported had altogether 135 pregnancies that were capable of being influenced by phthisis. Ninety-five of the pregnancies went to full term. There were 28 premature deliveries and 9 abortions.

Fifteen women presented some signs of phthisis, more or less advanced, when they became pregnant; they had altogether 20 pregnancies. Ten went to term, 8 were premature, and there were 2 abortions. Ten infants were wet-nursed, and 10 (including the 2 abortions) died within a few days after birth.

Seventeen women apparently caught cold during the winter months and coughed a little when they became pregnant; they had altogether 33 pregnancies. Twenty-five went to term, 3 ended at eight or eight and one-half months, 1 at three months, and 1 at four months. (Three had not yet been confined.) Only 4 women nursed, and these for three or four months. Six women died, on an average two weeks after delivery; 3 presented cavities a few days after delivery; 3 had some signs of phthisis during the first

stage and 5 during the second. Twenty infants died a short time after birth; 6 were wet-nursed.

Eighteen women, who did not cough at all during pregnancy, presented the first symptoms of tuberculosis during the first half of gestation. They had altogether 20 pregnancies. Eleven were at full term, 6 ended during the ninth month, and there were 3 abortions. Only 2 women nursed. Twelve women died; 10 within a month after delivery, and the remaining 2 in 15 and 16 months. Four women had some cavities shortly after confinement; 1 some signs of the first stage, and another signs of the second stage.

The series of observations illustrates well the disastrous influence of phthisis upon pregnancy, and vice versa.

Twenty-nine women who did not cough during pregnancy and of whom only seven presented the hereditary tubercular antecedents, showed the first symptoms of pulmonary tuberculosis during the second half of gestation. They had altogether 33 pregnancies; 24 of these went to end of term, and 9 ended before that time; 5 infants were born dead; three nursed—3 weeks, 4 months, and 7 months, respectively; 11 women died; 7 of them 6 days after confinement, and 4 11 months afterwards. Thirteen women had cavities, 5 of which were observed 6 weeks after confinement, and the other 8 within 13 months afterwards. Eight infants died shortly after birth; 17 were wet-nursed; 5 were born dead.

Twenty-nine women, not having coughed during pregnancy, presented some early symptoms of pulmonary phthisis; 25 after delivery at term, 2 after premature delivery, and 2 after abortion. Only 10 women nursed; 2 were not able to continue nursing on account of their health, and in the other 8 cases cough did not begin until after several months' nursing. Nine died, including the abortions.

Altogether, the 95 women had 135 pregnancies, 95 of which went to full term, 28 were premature, and 8 abortions (3 not delivered at the time of the report). Excluding the 29 women who began to cough after delivery, there remained 66. Six died on an average of 10 days after delivery, 6 on an average of 15 days afterwards; 7 of 16 days afterwards, and 10 of 28 days afterwards; 7 women died on an average 13 months after confinement. Nineteen women had some pulmonary cavities at an average of 2 months and a half after confinement; 8 at an average of 13 months afterwards.

There were in all only 21 nursings, half of which were scarcely regular; 53 infants were wet-nursed (approximately); 59 infants died a short time after birth (including 9 abortions).

A number of the women had repeated pregnancies at full term and were able to nurse their children, but some of them became phthisical. Others did not carry the pregnancy to term.

22. Gueniot, "Oedème généralisé chez une femme enciente atteinte de tuberculose" (*Jour. des Sages-femmes,* Paris, 1876, iv, 178).

23. Lebert, A., "De l'influence de la grossesse et des couches sur

la marche de la phthisie pulmonaire" (*Nice méd.*, 1877-78, ii, 125-130).

24. Letulle, M., "Hémorrhagies puerpérales multiples dans un cas de tuberculose pulmonaire, avortement au troisieme mois; injections sous-cutanées d'ergotine et d'éther; tamponnements prolongés" (*Paris méd.*, 1879, i, 280-285; also *Bull. Soc. clin. de Paris* (1879), 1880, 4-11).

25. Gaulard, L., "De l'influence de la grossesse sur la tuberculose," Paris, 1880.

26. Denuce, M., "Accouchement prématurе de deux foetus mort-nés pendant l'agonie d'une femme tuberculeuse; examin des organes génitaux" (*Jour. de méd. de Bordeaux*, 1880-81, x, 263).

27. Petiau, F.-A.-G., "Etude sur la phthisie dans ses rapports avec l'accouchement, la grossesse et la lactation" (*Thèse de Paris*, 1885). 1. When a woman becomes phthisical during pregnancy, which is not unusual, the pregnancy plays a very important part in the development of the tuberculosis. 2. When symptoms of phthisis occur during gestation, they appear during the middle more frequently than during the second part. 3. Confinement, occurring in the course of pulmonary phthisis, has rarely produced permanent amelioration. Almost always the disease remains stationary or grows worse after delivery. 4. Gestation does not produce pulmonary tuberculosis, but it assists in developing and maturing the predisposing causes. 5. In some cases the diathesis was not apparent before the discovery of the disease, but such cases show hereditary antecedents. 6. Every period of adult life is favorable to the development of tuberculosis. 7. Lactation enfeebles the patient with phthisis more than does pregnancy. 8. The puerperal state appears more grave than the state of gestation.

28. Krelin, G., "Twin pregnancy and malformations in hereditary tuberculosis." Presented before the Obstetrical Society of Paris, July 6, 1899. The patient was 25 years old, with tubercular antecedents. III-para; gave birth to dead male twins, one of which weighed 490 gr. and was 40 cm. in length; the other weighed 380 gr. and was 36 cm. long. The first, the stronger child, showed a very marked disproportion between the right and left lower extremities; the latter was considerably smaller and thinner and showed a cicatricial line on the upper part of the thigh. Klerin emphasizes the relation between tuberculosis, twin pregnancy and malformation. However, he does not seem to have sufficient grounds for his contentions.

29. Mitchell, H. W., "Tuberculosis complicated by pregnancy," presented before the Section on Obstetrics and Gynecology of the New York Academy of Medicine, January 25, 1900. The paper contains the report of two cases of advanced pulmonary tuberculosis in pregnant women. In the first case the patient was in the 8th month and appeared to be in bad physical condition. However, she went to full term, delivered herself spontaneously, and afterwards made a quick recovery. Tubercle bacilli could not be

demonstrated, which, of course, suggests the possibility of a mistaken diagnosis. In the second case, the report states, tubercle bacilli were demonstrated. The course was practically the same as in the first case. The treatment was the use internally of an antiseptic tonic.

30. Kaminer, "Concerning the influence of pregnancy and delivery upon phthisical processes, and the therapeutic value of introducing artificial abortion" (*Verein für innere Medicin zu Berlin,* June 3, 1901). After the consideration of 50 cases, Kaminer concludes that on account of the unfavorable influence of phthisis in pregnant women, pregnancy ought to be interrupted in case a cure can be expected. In advanced cases pregnancy should not be interrupted. Artificial abortion, because of diminished danger, is preferred to miscarriage.

31. Hamburger, "Concerning the justifiability of interrupting pregnancyin tubercular working women" (*Berl. med. Gesellschaft,* June 4, 1902).

As the result of the observation of ten cases, in which tubercular patients grew worse during pregnancy, Hamburger advocates the prevention of conception in tubercular women of the poorer classes, or interruption of pregnancy in its early stages. Consultation with a colleague and a precise protocol are the conditions.

32. Veit, "Tuberculosis and Pregnancy" (75 *Versammlung deutscher Naturforscher und Aerzte in Cassel; Abteilung für Geb. und Gyn.,* Sept. 21, 1903).

The combination of pregnancy and tuberculosis is very detrimental. The transmission of the tubercle bacillus to the fetus is certainly possible. Moreover, there exists the danger of abortion, and especially the danger that the tuberculosis will become acutely much worse during the puerperium, which in a large percentage of cases leads to a rapidly fatal termination. On the other hand, however, a great many women pass through pregnancy and the puerperium without any exacerbation of the tuberculosis. Veit determines the prognosis by the weight of pregnant tubercular women. In the presence of a normal weight, the prognosis is good. In those cases that do not show the normal increase in weight during gestation, such as is nominally due to the growing fetus, the amniotic fluid, the placenta and the uterus, spontaneous abortion usually occurs. Possibly in such cases artificial abortion would be useful, although in general Veit does not approve of this procedure. Finally, in women who show a loss of weight during pregnancy, the prognosis is bad. They usually die during the puerperium. In view of the fact that the induction of abortion has not cured a tubercular patient, women who are tubercular should be treated for their tuberculosis before the possibility of pregnancy is permitted.

Ahlfeld, in discussion, stated that he saw no indication for the induction of artificial abortion in tuberculosis. These patients should be watched and treated a long time before resorting to such

extreme methods. Moreover, one or even two pregnancies carried to term are not as dangerous as a series of successive artificial abortions, so far as the tubercular process is concerned.

Hahn: Anticonceptional means cannot altogether be avoided, but the special recommendation of artificial abortion is to be condemned.

Asch: In private practice, women who appear well and even better during pregnancy than before, often experience a very rapid exacerbation of their tuberculosis after the puerperium. On the other hand, cases are often observed in which the tubercular disease takes rapid strides during pregnancy, indeed even from the very inception of pregnancy, so that the interruption of pregnancy is advisable. Many cases of tuberculosis improve after abortion. The social condition must be taken into consideration. If we can as little effect a cure of the tuberculosis by the interruption of pregnancy as we can by preventing conception, we can, nevertheless, save the mother to her family for a longer time after artificial abortion by applying all therapeutical means than through the doubtful preservation of the doubtful life of the fruit of conception at the expense of the mother.

Koenig agrees with Veit, that the induction of artificial abortion because of tuberculosis, goes against our professional feeling, although he is not altogether opposed to the induction of abortion. It is conceded that pregnancy acts in general unfavorably upon the course of tuberculosis, and we advise against conception, where this is possible. Although we observe cases in which the body weight increases during pregnancy and the condition of the lung is not made essentially worse, notwithstanding existing tuberculosis of the lung, we should, on the other hand, never hesitate in cases of rapidly progressing tubercular processes, to interrupt pregnancy early, especially during the first half of gestation. The more often we are able to bring tubercular women under favorable hygienic conditions during pregnancy, the less often will we be forced to this extreme measure.

Tuszkai: The rapid diminution of the daily quantity of urine and of the relative proportion of chlorides in the urine, and the appearance of mononuclear and polynuclear megaloblasts in the blood, are of great significance as early indications of inanition and decrease in body weight.

O. Schaeffer: Working against the resistance is especially difficult when we attempt to cure tubercular processes, and the weight regulation is very important. The healing or curing of the disease ought to be emphasized to a greater degree than artificial abortion.

P. Müller: In incipient tuberculosis, where there is only a marked apical catarrh and the general condition of the patient is relatively good, artificial abortion is unjustifiable. When the local trouble becomes worse or when the general condition of the patient begins to suffer, there is still time to resort to active measures.

Veit, in closing, drew the following conclusions as the result of

the discussion: 1. Abortion is indicated, on account of phthisis pulmonalis, more often than he admitted, and for this reason it is necessary to establish the indications as accurately and positively as possible. 2. There exists an aversion to artificial abortion among a number of colleagues as it does in him. The performing of abortion is technically easy, but morally very hard. The desire of the woman should have no weight; the indications should be purely objective. In cases of decrease of weight, we may consider the induction of abortion, but it will probably not have any definite result.

33. L. Kingsford (*Lancet*, Sept. 24, 1904), studied the post-mortem records of 339 cases of tuberculosis in children up to 14 years of age, at the East London Hospital for Children; 162 cases occurred during the first two years of life; 270 during the first five years. In almost half the cases (49 per cent.) the infection apparently entered through the mucous membrane of the trachea or the large bronchi. The lymphatic glands were tuberculous in 90 per cent., the infection being primary in 68 per cent. Of the total number of cases, 216 were apparently due to infection through inhalation; 65 were ascribed to ingestion of infectious material, and the remainder of the cases were of doubtful origin. That the cases ascribed to ingestion, were due to infected food, is not clear. Thus, one of the cases ascribed to indigestion was a tubercular tonsil, which certainly could be caused by inspiration. Indeed, any of the cases may have been due to inspiration of infectious material and deglutition of the contaminated saliva. The report serves to emphasize the importance of infection through the respiratory tract in children.

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MIGRATORY UTERINE FIBROIDS.*

BY

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(With three illustrations.)

It is not common for a fibrous growth to be connected with the uterus by a bridge of tissue attenuated enough to be designated as a pedicle. Subperitoneal fibromata are common enough, but they are, as a rule, attached by a broad base, or the nodule rests lightly upon the uterus, and is not separated from it by a stalk or pedicle. Even more rare is the complete separation of the fibrous growth from the uterus, giving rise to the so-called migratory fibroid.

* Read before the Am. Gyn. Soc., May 25, 1905.

During the past year it has been my good fortune to meet with three cases, so clearly illustrating the different stages in the separation of such growths as to arouse my interest.

The literature of the subject is exceedingly meager. Text-books either fail to mention the intraabdominal separation of such uterine tumors, or dismiss it with a few lines. Yet, while no doubt rare, as compared with the total number of uterine fibroids, it is not so infrequent as to merit the entire disregard of the gynecologist. Aside from the difficulties of diagnosis of such tumors, in at least two of the cases (Homans' and Paton's) the abnormal situation of the growths, and the resulting adhesions were responsible for obstruction of the bowels, with fatal termination.

Since I have been unable to find any monograph with a list of cases of migratory fibroids, I have thought it best to abstract the 20 cases I have collected from the literature. I have tried to exclude doubtful cases, where the tumor might have had some other origin. The majority of the reports submitted are meager and unsatisfactory. Most of the cases were merely mentioned in passing, or the specimen was shown before some society with a few remarks and an incomplete history. The list does not aspire to completeness, but at least is a start in a certain direction, and will serve as a basis of comparison.

West, Ch. 1. (1867.) West mentions in his treatise a tumor which had arisen from the posterior uterine wall and was situated in the cul-de-sac of Douglas. It was the size of a walnut, perfectly free from the uterus and held in place by false membranes.

Huguier. 2. (1860.) Huguier reported his observations on certain fibroid tumors of the pelvis, entirely disconnected with other pelvic organs. He mentions one case observed by him in 1845. The tumor was intrapelvic, and was adherent in the vicinity of the left sacroiliac articulation. He mentions four other tumors of similar nature, but extrapelvic. Their cause is unknown, although he has never observed any except in adults. They are quite movable, hard and indolent. Pain may be very severe in some cases. (The exact nature of these growths is so uncertain that I have concluded to count them as but one case.)

Turner, Wm. 3. (1861.) Turner found, during a postmortem examination, a left ovary separated from its broad ligament attachments and adherent to the posterior peritoneum covering the bodies of the last lumbar and first sacral vertebra. On the floor of the rectovaginal pouch was a reddish tumor the size of a hazel nut, quite loose in the cavity, and having no connections

with the adjacent parts. Its structure was that of a uterine calcareous fibroid.

Nélaton. 4. (1862.) Nélaton reports the case of a woman, aged 26, who four years before had a normal confinement. Shortly afterwards she noticed a small, hard growth in right iliac fossa, which, as it increased in size, caused lancinating pains, radiating to the neighboring parts, and to the hip and thigh of the same side. The pains were more severe and hard at night. She suffered more in summer than in winter, and especially at the menstrual period. Such tumors are fibrous in structure, and much resemble in structure and consistency uterine fibroids.

Simpson, J. Y. 5. (1870.) Simpson in his work on obstetrics refers to the case of a lady, the subject of an extrauterine pregnancy, at whose death, consequent upon a puerperal peritonitis, a fibroma was found attached to the anterior abdominal wall. The pedicle of the growth, formerly connected with the uterus, had been torn away by the increase in size of the latter organ.

Porter, F. T. 6. (1875.) Porter showed a specimen of a fibroid of interest because it was quite free and unattached to uterus or Fallopian tubes. There was a tumor of smaller size in the uterus, and there was a polypus attached to the os. The specimen was removed from a woman 50 years of age.

Harrison, Geo. T. 7. (1878.) Harrison reported a case where he held an autopsy on a woman who had been failing for some time, and had been tapped for dropsy. A detached uterine fibroid wedged among the viscera was found. It was completely free from the uterus, and obtained its nourishment from the peritoneum. Uterus and appendages were normal.

Baldy, J. M. 8. (1889.) While performing an abdominal operation for the removal of a uterine fibroid, Baldy found a small, free body the size of a walnut in the peritoneal cavity. It was dense and white, and on section calcareous. There were evidences present of a former pedicle. Judging from appearances and calcification, it had been free in the cavity some months.

Homans, John. 9. (1889.) Homans reports the case of a woman, 28 years old, who shortly after marriage was found to be pregnant. Examination showed in addition a fibroid tumor connected with the uterus. During her pregnancy she had two attacks of abdominal pain and distress. These subsided, and patient was delivered of a healthy child. Shortly after confinement she had another attack of pain, accompanied by vomiting and signs of obstruction of the bowels. Autopsy showed a fibroid tumor de-

tached from the uterus and adherent to the lateral parietes. It was enveloped by and adherent to the omentum and intestines. The adhesions to the latter had given rise to the obstruction.

Eve, F. S. 10. (1890.) Eve reports post-morten findings in the case of an old woman. An oval tumor was found lying free in the cavity. It was calcareous, lying within scanty, soft, fleshy material. Microscopically it showed the structure of a myofibroma.

Wylie, W. Gill. 11. (1894.) Wylie reports the case of a patient, 35 years old, who had suffered from melancholia since the birth of her last child, four years before. Bimanual examination showed a large, soft uterus, held back in the pelvis by a hard tumor the size and shape of a large kidney. It lay between the bladder or pubic bone and the uterus, and was not very firmly attached. At the operation the tumor was found to be fibroid, entirely detached from the uterus and rolled up in the omentum. It was covered with a calcareous shell.

Routh, A. 12. (1896.) A tumor the size of a turkey's egg was removed from a woman aged 50 years, who had ceased to menstruate two years previously. She had had severe pains in the pelvis for some months, marked abdominal tenderness, and some pyrexia. The tumor lay behind the uterus, was distinct from it, and was adherent to the small intestines. The growth was non-vascular, and in an advanced stage of calcareous degeneration. Scar on the fundus showed where tumor had been attached.

Wallace, A. J. 13. (1898.) Patient aged 38, married two years. A smooth, hard tumor lay in the central portion of the abdomen. Its mobility was limited. It could be moved from side to side, but not downwards. The pregnant, retroverted uterus lay behind the tumor. The later was found adherent to the left and anterior pelvic quadrant, left side of promontory of sacrum, and right side of pelvic brim and appendix. The tumor was calcified, weighed one pound and two ounces, and was entirely free from the uterus.

Reindfleisch, W. 14. (1899.) In the course of a post-mortem examination of a woman of 57, who had died of advanced cardiac lesions, Reindfleisch discovered a hard tumor, size of a goose egg, lying entirely free in the right iliac fossa. It was calcareous, and microscopically presented a typical picture of a uterine fibromyoma.

Stern and Sperling. 15. (1899.) Reindfleisch reports an unpublished case of Stern and Sperling, where the diagnosis lay

between pedunculated fibrous, and ovarian tumors, associated with marked ascites. At the operation an unattached tumor the size of a child's head was found in the small pelvis. Microscopic examination showed the appearances of a degenerated fibromyoma. There was also an old exudative peritonitis, probably due to the irritation arising from the tumor.

HANKS, H. J. 16. (1899.) Hanks, in discussing a case reported by Aspell, where a pedunculated adherent uterine fibroid showed evidences of previous twisting, mentioned having found at operation a fibroid entirely severed from the uterus, and nourished by the omentum.

JACOBS, C. 17. (1901.) Jacobs reports the case of a nullipara, aged 21, whose menstruation began at 14½ years, and who had always been regular up to 18. Since then she had been irregular, especially as regards duration. For the past two years has noticed a slow and progressive enlargement. For some months this has caused her great inconvenience. Examination showed a mobile tumor in the upper portion of the abdomen, extending several fingers' breadths below the umbilicus. Its upper portion is rounded; it is hard, smooth above, irregular below. Fluctuation is perceptible in certain places. Uterus and appendages were normal. Laparotomy showed a solid fibrous tumor, with smooth and shining surface. Behind it was a second fluctuating mass corresponding to the concavity of the diaphragm. A large quantity of brown liquid evacuated. The entire mass weighed 12 to 15 kilograms.

WILLIAMS, W. ROGER. 18. (1901.) (Two cases.) Williams speaks of two specimens in the Hunterian Museum. One consisted of two detached tumors situated between the rectum and uterus, having been sequestrated from the posterior wall of latter. One was four inches in diameter, the other somewhat smaller. Their contiguous surfaces were slightly adherent, and both tumors were dense and solid.

A second specimen, from the same Museum, consists of a large calcified kidney-shaped myoma, 7x3½ inches, sequestrated from the uterus and grafted on the adjacent abdominal structures.

PATON, E. P. 19. (1903.) Patient, 48 years old, single. Fourteen days before admission to hospital was seized with pain in the abdomen. There was profuse vomiting, and constipation which was not relieved by purgatives. Had had a similar but not so severe an attack five years before. There was a tumor on the right side of the abdomen, extending from loin to umbilicus. The

abdomen was opened by an incision in the right linea semilunaris. The tumor was found to be attached to gut and mesentery. Wound closed as mass was thought to be malignant. Patient died a short time later. Autopsy showed ordinary signs of intestinal obstruction. The tumor was seen to be transplanted uterine fibroid, which originally had arisen from a small stalk on the posterior aspect of the uterus. Tumor was oval in shape, measured 6x9 inches, and weighed 5 pounds. It was adherent to two feet of mesentery and small intestine a foot above iliocecal valve. It was connected with the omentum, from which it received most of its blood supply. A twist of the mesentery had given rise to the obstruction. Microscopic examination showed it to be an ordinary uterine fibroid.

Possibly the most interesting problem in connection with the study of migratory fibroids has to do with the causes of their change of position. Evidently a subperitoneal fibroid with a broad base cannot either be thrown off or twisted from the uterus. It is perfectly conceivable that a fibroid nodule without a pedicle, but lying upon the uterus, and only slightly attached to it, might, through adhesions to other pelvic organs, be twisted from the uterus. I have seen multinodular uterine fibromata, where certain nodules were so slightly attached to the tumor mass, as to come away during the gentle manipulations necessary to the removal of the growth. It is easily conceivable that such a nodule attached firmly to the lateral wall of the pelvis might be torn off from a gradually enlarging, pregnant uterus. Still, in the large majority of cases, separation only occurs in pedunculated growths through atrophy resulting from twisting, or compression of the pedicle. Ovarian tumors, which almost invariably are pedunculated, are more liable to have these pedicles twisted than is the case with fibroid growths. I have met with four twisted pedunculated ovarian cysts in the course of a ten days' experience. It is also true that migratory ovarian cysts are more common than are sequestrated fibroid growths. Rokitansky, 20, as far back as 1860, reported seven cases of the separation of ovarian cysts, and there have been numerous cases recorded since.

The results of the twisting of the pedicle of a uterine fibroid will evidently depend upon the resulting interference with the blood supply of the tumor, and the suddenness with which this is brought about. If the twist is sudden and complete, the subperitoneal growth usually becomes gangrenous, with a resulting fatal septic peritonitis. Such a case was reported by Cuppie, 21, where the

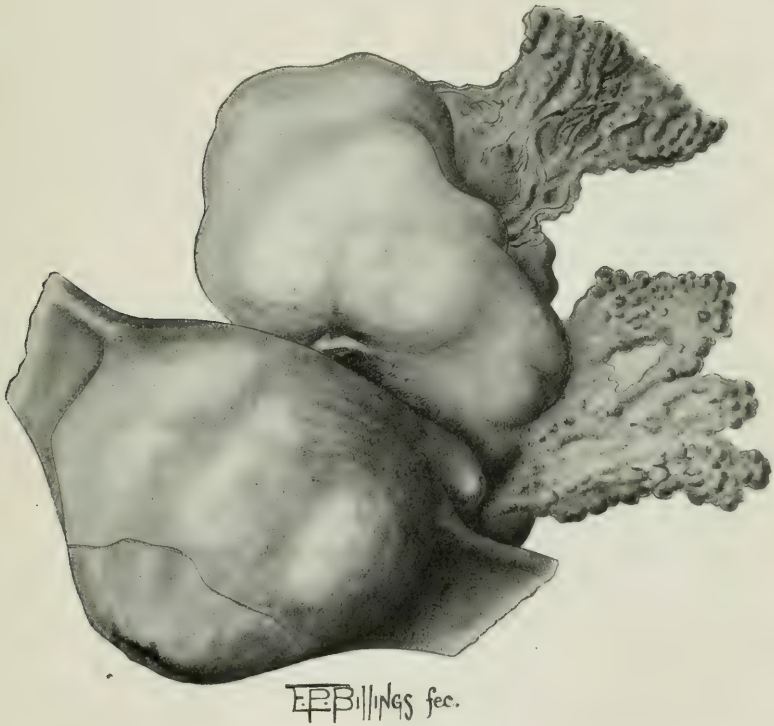
patient died, following an abortion. The autopsy showed gas and pus in the peritoneal cavity. A subperitoneal fibroid was attached to the right horn of the uterus by a pedicle twisted one and a half times. The tumor was black and gangrenous. Usually, however, the blood supply is not entirely shut off from the tumor by the twist of the pedicle. But it is interfered with and a more or less localized peritonitis is produced about the growth, causing it to adhere to the surrounding parts. This does not always occur, for of the 20 cases 7 were quite free and loose in the pelvic cavity. In 11 cases the growth was attached to various pelvic and abdominal structures from which it received its blood supply. Naturally, the humors were more frequently attached to some portion of the pelvic peritoneum. One tumor was connected with the anterior abdominal wall, and in one instance the appendix was attached to the growth. One tumor had broken away from the uterus and was attached high up in the abdominal cavity near the diaphragm. In three cases the nodules were attached to the omentum and received their nourishment from the vessels of the latter.

Interference with the blood supply is a frequent cause of degenerative changes in the growth. Eight, or nearly one-half of the 20 tumors, showed evidences of calcification. Five of these calcified nodules were adherent to other structures, while of the remaining, three were quite loose in the peritoneal cavity. These calcareous changes can take place before or after the severance of the pedicle, although the high percentage of calcareous changes among the migratory fibroids would lead to the inference that severance from the uterus increased the tendency to calcification. For there were only 3 calcified tumors among the 16 cases of fibroids with twisted pedicles collected by Bernard.[22]

The size of the tumors were mentioned in 12 out of the 20 cases. It is usually stated that these migratory fibroids are small, and hardly ever reach the size of an egg. This statement is not borne out by a study of the present series of cases. The tumors varied in size from a hazelnut to one weighing 15 kilograms. One weighed 1 lb. 2 ozs., another 5 lbs. In one case the tumor measured 4 inches in diameter, and in another the size was 7x3½ inches. Walnut, large kidney, turkey's egg, goose egg, and child's head are the names mentioned in describing the size of the remaining growths. Thus, most of the separated nodules were fairly sizable tumors, large enough to be of importance in different diagnoses and not merely anatomical curiosities.

The following case shows the great friability of the pedicle in certain pedunculated fibroids:

CASE I. *An irregular shaped subperitoneal fibroid size of the fist, attached to the uterus by a very slender pedicle. This latter very friable and broke away from the uterus during the latter's removal. Omentum attached to posterior surface of fibroid and partially nourishing it.*



Peterson. Case I.—Pedunculated Subperitoneal Uterine Fibroid partially Nourished by Adherent Omentum.

Gynecological number 1185, age 41, married. Was referred to the University of Michigan Hospital, March 3, 1905, by Dr. H. W. Whitmore, of Quincy, Mich. The patient has had one child, no abortions. Was lacerated at birth of child thirteen years ago, and has been very nervous ever since. Has had a great deal of trouble with her stomach for years.

Examination at entrance showed a uterus with a number of

nodules projecting from its surface. Attached to the fundus was an irregular pedunculated subperitoneal fibroid as large as a turkey's egg.

Operation, March 28, 1905. The uterus was enlarged and studded with interstitial and subperitoneal nodules. Attached to the posterior surface of the fundus by a slender pedicle was an irregular fibroid about one-half the size of the fist. Fig. 1. The omentum was attached to the posterior surface of this nodule, and was evidently partially nourishing it. So thin and friable was the pedicle that it became severed from the uterus while a supravaginal amputation of the latter was being performed. The omentum was ligated and a portion removed with the tumor. Cholecystotomy, and the removal of the eleven gallstones through a second incision parallel to the ribs, was done. The patient made an uninterrupted recovery.

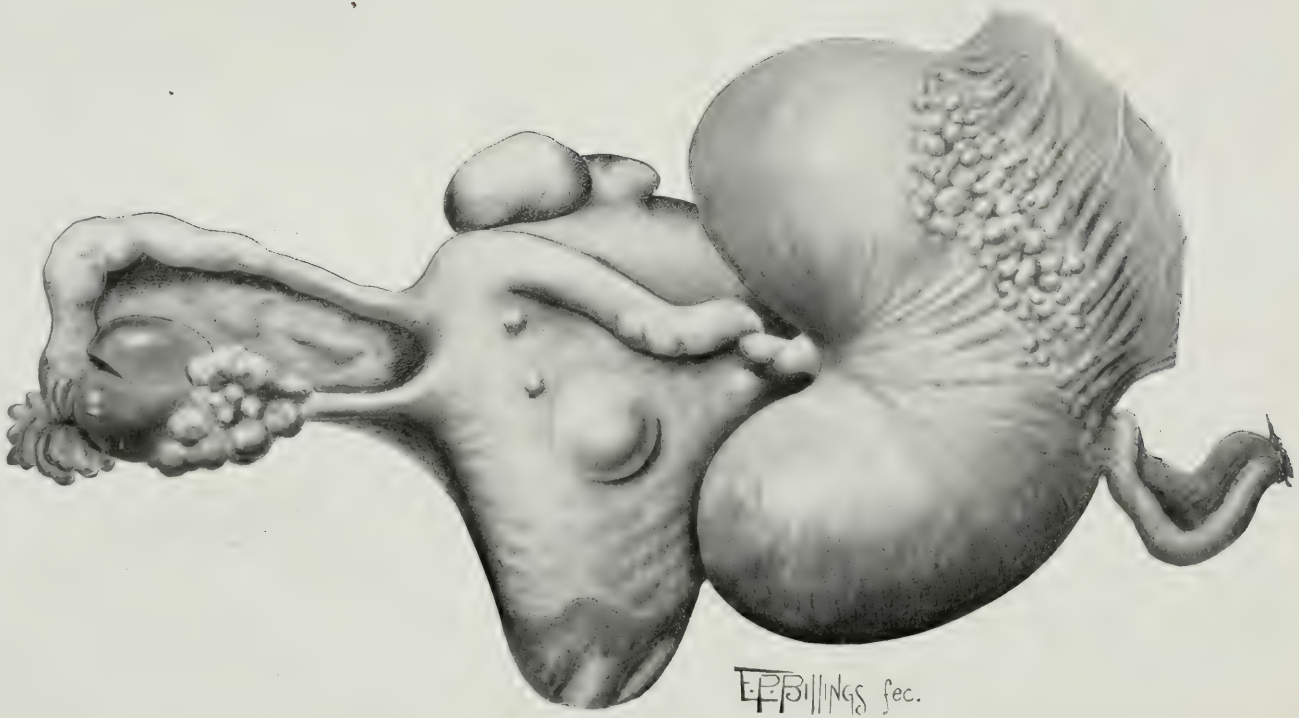
Microscopical examination of the pedunculated nodule showed it to be a myofibroma.

It must not be inferred from previous remarks that a twist of the pedicle is essential to the formation of adhesions of a subperitoneal pedunculated fibroid to other structures. Torsion of the pedicle, and the resulting inflammation is only one of the causes. I have seen the omentum adherent to a fibroid uterus when the appendages were perfectly normal and the adherent omentum was the only sign of previous peritoneal inflammation. That a large part of the tumor's nourishment in the case above was derived from the omental vessels was apparent from the absence of bleeding when the pedicle was torn off during the removal of the uterus. A sudden twist of the pedicle in this case would have caused few, if any, symptoms. The pedicle would have soon atrophied and the tumor would have left the uterus, and been nourished by the omentum.

The next case shows the second stage of the separation.

Case II. *Subperitoneal uterine fibroid the size and shape of a normal kidney connected with the uterus by a narrow pedicle twisted once and a half on itself. Tumor situated on the right uterine horn, although pedicle came from other horn. Also attached to bladder, pelvic peritoneum, omentum and appendix.*

Private case No. 158, 45 years old, single. Referred by Dr. E. Wood, of Toledo, Ohio. Entered my private hospital November 22, 1904. She had always been strong and well until the past year, when she broke down from overwork. Has been resting and taking various kinds of treatments ever since, but became worse



PETERSON. Case II.—Subperitoneal uterine fibroid, size and shape of a normal kidney, with narrow pedicle twisted one and one-half times upon itself, attached to omentum and appendix.

rather than better. Has suffered from pain in the rectum, low down in front, for a number of years. Has had considerable pain at times in the lower abdomen.

Examination under chloroform at entrance showed a uterus with its surface studded with numerous fibroid nodules the size of marbles. Connected with the uterus, and only slightly movable, was an oblong mass the size of the closed fist. It was hard and somewhat irregular.

Operation, November 23, 1904. Upon opening the peritoneal cavity the uterus was found enlarged and the seat of a number of small fibroids. The oblong mass detected by bimanual examination was seen to be a subperitoneal fibroid with a long slender pedicle, twisted once and a half on itself. The tumor resembled a normal kidney in shape and size. Fig. 2. It was quite densely adherent to the bladder peritoneum, to the right side of the pelvis, and to the omentum. The appendix was also adherent to it. The right tube and ovary were attached to its under surface. Although it rested upon the right horn of the uterus, the base of the pedicle was attached to the left uterine horn. This pedicle was two millimeters in diameter and four centimeters in length. The pedicle was clamped, the growth released from its adhesion, and removed. The uterus was amputated at the internal os. The appendix was also removed. With the exception of some oozing from the adherent surfaces necessitating secondary drainage through the posterior cul-de-sac, the patient made an uninterrupted recovery.

Microscopical examination showed the mass to be a myofibroma. Evidently the tumor was on the right side of the pelvis when the twist occurred and the resulting inflammatory reaction gave rise to the adhesions enumerated. These adhesions are, therefore, secondary to the torsion, for it would have been an utter impossibility for the twist to have been secondary. The resemblance of the fibroid growth to a kidney was striking. Even when exposed through an abdominal incision it became necessary to trace the tumor's connection with the uterus before its exact nature could be determined. In Wylie's case,[11] the tumor also was the shape and size of a large kidney. Certainly these two cases should be remembered in endeavoring to ascertain the exact nature of a pelvic tumor resembling the kidney in shape and size, especially when one considers the frequency of floating right kidney, and the possibility of the kidney's being adherent in the pelvis. Sutton[23] has had knowledge of four cases in which the kidney was a pelvic organ,

three in women and one in a man. In one of the instances it was associated with pregnancy and impeded delivery.

In Wallace's case[13] the appendix was also attached to the tumor. This is not surprising considering the frequency with which the appendix is found located in the pelvis in women. The appendix is not infrequently found adherent to ovarian cysts situated below and above the pelvic brim. Chognon[24] has collected twenty such cases. I found the appendix adherent in three out of twenty-four cases of ovarian cysts.[25]

Just as is the case with ovarian cysts, the degree of twisting of the pedicle of a subperitoneal fibroid may vary within wide limits. Bernard[26] in his thesis reports a case under his observation where the pedicle of a fibroid tumor twice the size of a fetal head was twisted seven times about itself. Of course, the tighter the twist of twists, the greater will be the interference with the blood supply to the growth. And the more quickly will the separation of the tumor occur.

Time will suffice for only a brief consideration of the causes of the torsion of the pedicle of a subperitoneal uterine fibroid. Evidently if one portion of the growth was more developed than another, gravity would cause the rotation of the growth towards the heaviest side, with the result that the pedicle might be twisted on itself. The relations of the growth of the bladder and rectum probably have something to do with the rotation of the growth. A very full bladder or rectum might push the growth in a number of directions, or the sudden emptying of either receptacle might alter the relations of the growth to the pelvis. It is more rational to look to the movements of the patient, or to the contraction or relaxation of the abdominal walls for the most frequent explanations of twists of the pedicle. Obviously, if the tumor be rather freely movable in the pelvis, the patient's' turning upon her side would have more effect upon the relative position of the tumor than the causes already enumerated. In ovarian cysts this certainly holds good, for post partum twist of the pedicle is very common. To my mind the explanation lies in the relaxed abdominal walls, and the greater room in the pelvis and abdomen after the emptying of the uterus.

The next case shows the complete severance of the pedicle, and the extrapelvic location of the fibroid.

Case III. *A hard, smooth tumor, the size of an orange, unattached to the uterus, having all the characteristics of a subperi-*

toneal fibroid, surrounded on all sides by the omentum, and nourished entirely by the omental blood vessels.

Gynecological, No. 945, age 53, married. Referred to the University of Michigan Hospital, July 6, 1904, by Dr. Chas. McIntyre, of Woodland, Mich. Menstrual history, normal. Two children, no abortions. Passed through the menopause four years ago. Six years ago patient noticed a lump in her right side. Has been increasing in size ever since, but did not give her much trouble until two years ago. Since then she has had pains in the right groin and side. This pain is dull and continuous, often aggravated by stooping over. For the past two years she has flowed a good deal, sometimes passed large clots.

Examination at entrance showed the abdomen distended from the pubes to the umbilicus by a symmetrical, hard, interstitial, uterine fibroid. Laterally it extends well out to the sides of the pelvis. It is non-sensitive and quite movable. There was also a fatty tumor 6x9 centimeters just beneath the skin over the pubes. In the right hypochondrium was a hard, round mass the size of an orange. This tumor was non-sensitive, and moved freely on deep inspiration. It was rather difficult to outline because of the excessive amount of adipose tissue in the abdominal wall. The mobility of the growth was its marked characteristic, as it could be readily pushed into the right groin.

Operation, July 19, 1904. The fatty tumor was removed through a six centimeter incision. The latter was then carried upwards through the abdominal wall. Upon opening the abdomen the movable tumor was found situated in the omentum, which was adherent to it on all sides. The tumor was the size of an orange, hard, and had all the appearances of a subperitoneal uterine fibroma, although it was entirely free from the uterus. It was removed with a considerable portion of the omentum. The irregular, multinodular fibroid in the pelvis, together with both tubes and one ovary, was removed by a supravaginal amputation. The appendix contained a fecal concretion, and was removed. The patient made an uninterrupted recovery, the wound healing by first intention.

Examination of the removed specimens shows a uterus which measures 9x13x16 centimeters. It is very irregular, being made up of different fibroid growths, some of which are pedunculated. The largest mass is in the posterior uterine wall. There were areas of calcification in this nodule. The fatty tumor was made up of four large lobules of adipose tissue. The omental tumor measures 7x6x5 centimeters. It is surrounded on all but the anterior

surface by the omentum. The omentum is merely attached to the growth, and does not penetrate into, nor is it a part of the tumor. On section it has a whorled appearance, and an elastic feel like a uterine fibroid.

Mycroscopically it presented the typical picture of a uterine myofibroma, and the presence of muscular tissue in a growth so situated is almost proof positive of its uterine origin. Then, again, it was not a tumor of the omentum, but the latter evidently was merely attached to its surface, and did not penetrate its substance.

The question of diagnosis in this case was extremely interesting. The nature of the movable abdominal mass was not suspected. As stated, it was not easy to exactly outline the growth on account of the large amount of fat in the abdominal walls. It was thought the tumor might be a floating kidney, although it was smaller than a normal sized kidney should be. In another case, given a fibroid uterus and a patient presenting no signs of malignant disease, I should at least consider the possibility of mgratory fibroid if there were a mass clearly separated from the uterus, and presenting none of the characteristics of other organs.

The objection might be raised that no direct proof has been advanced that the tumor was at one time connected with the uterus, but a moment's consideration shows that it must be a growth of that nature.

Besides, there is no proof that fibromatous tumors ever arise from the omentum. Warthin[27] says that while fibroma and lipoma of the omentum have been described, the former may in reality have been due to a localized fibroid thickening, resulting from inflammatory omental tumor. He also claims that the omental cysts reported under various names are in all probability primary tumors of the ovary which have been freed from their original attachments.

Where the tumor is situated within the pelvis, unattached from the uterus, proof that it is from the latter organ becomes more difficult because of the possibility of the growth having originated from fibromuscular tissue of the round uterovesical and uterosacral ligaments.[28] Oftentimes, however, the finding of a cicatrix upon some portion of the uterus will increase the probability of the tumor's uterine origin.

The subject of migratory uterine fibromata would be incomplete without a consideration of the possibility of the separation of tumor and uterus by the torsion of the latter upon itself. This would hardly be a migratory uterine fibroid; strictly speaking, it



PETERSON. Case III.—Subperitoneal myofibroma entirely detached from the uterus, surrounded on all sides by the omentum,

would be a "migratory fibroid uterus." But the fibroid might be so large and the uterus so small that the latter might escape notice if the tumor mass were not carefully examined.

Torsion of the uterus has been quite frequently noted. Schultze[29] has collected 32 cases. In 15 of these cases, the twisting of the uterus was associated with fibromata, while in 17 cases ovarian cysts were present. The uterus may be greatly stretched out by the growing tumor; then, if a torsion occurs, the cervix at the level of the vagina will be twisted into a mere string, and the uterine cavity obliterated at this point. Homans[30] reports such a case. The cervix was united to the body of the uterus above by a broad, flattened band of fibrous tissue forming a pedicle which had been twisted one and one-half times on its axis from left to right. A number of similar cases will be found in Schultze's article. The only case of entire separation of the uterus and appendages through torsion that I have been able to find, is one recently reported by Ricard.[31] He showed before the Surgical Society a curious specimen of a uterus completely amputated by torsion. The fibroma which produced the torsion was situated in the posterior wall of the uterus. The uterus was severed at the cervix at the level of the vaginal insertion, and was only held there by a thin string formed by the serous folds which were twisted upon themselves. The tubes had completely twisted themselves about the uterus.

This is apparently a unique case, still it shows the possibility of torsion of the uterus under certain conditions. Such a tumor would be very puzzling from the standpoint of diagnosis. Such a mass could contract adhesion with adjacent structures, and simulate almost exactly true migratory fibromata.

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ARTERIOSCLEROSIS OF THE UTERUS AS A CAUSAL FACTOR IN UTERINE HEMORRHAGE.*

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(With two plates and one illustration.)

In November, 1900, I read before the Chicago Gynecological Society a paper entitled "Arteriosclerosis of the Uterus, with Report of a Case of So-Called Apoplexia Uteri." After giving a summary of all recorded cases, I concluded with the following statement:

Arteriosclerosis alone has been charged responsible for uncontrollable uterine hemorrhage by Herman, Martin, Reinecke, and Küstner. The charge cannot be wholly sustained, because in none of their cases is there a record of having excluded other possible causes lying beyond the uterus. Reinecke and Martin performed hysterectomy in 13 cases for the control of hemorrhage, and in all the removed uteri the arteries were found sclerosed; but they did not exclude the possibility of obstruction to the return circulation from such causes as diseases of the heart and lungs, thrombosis of the venous trunks, and portal congestion from whatever cause. My point is that in the light of the 12 cases reported by Von Kahlden, Popoff, Herxheimer, and Dittrich, and the one I now report, arteriosclerosis *per se* may not be alone sufficient to cause a hemorrhagic infarction of the uterine tissues or hemorrhage into the uterine cavity. In the 8 cases reported by Von Kahlden the post-mortem findings showed anatomical hindrances to the general circulation. There was pneumonia in two of the cases, pulmonary emphysema and bronchitis in three cases, cancerous infiltration of the lungs and liver in one, pulmonary infarcts in another, and in four of the eight cases there were heart lesions. In the case of Popoff there were granular nephritis and heart thrombi, pleural effusion and infarction of the lung and brain. In Herxheimer's case there was a hypertrophied heart with thrombi in the left ventricle and right auricle, granular nephritis, and atheroma of the

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aorta. In my own case hemorrhage did not occur until the additional obstruction to the circulation caused by the plugging of the uterine artery with thrombi. It is therefore not conclusively demonstrated that arteriosclerosis can in itself be the cause of uterine hemorrhages. It would appear that there must be additional causes for obstruction, such as were found in the above-recorded cases.

Since writing the above, I have had several opportunities to make clinical and anatomical studies of cases operated for uterine hemorrhage of obscure origin, and I have come to believe with Theilhaber and Meier that *the essential cause lies in the myometrium, that the sclerosed blood vessels and remote embarrassments to the circulation exercise a secondary and minor influence.*

Referring to recent text books and current literature, little prominence is given to chronic metritis, and rarely is it mentioned as a primary lesion. Much is written of metritis due to the extension of an infection from the endometrium, and hence secondary to endometritis, but metritis as a primary lesion has been almost wholly ignored since the advent of bacteriological investigations of the uterus.

It is granted that infections of the uterus are located primarily in the endometrium and may or may not extend to the myometrium, but a condition which we are pleased to call chronic metritis is a very common one, and is frequently independent of infection and primary in the muscular wall of the uterus.

We find the uterus contracting periodically from the time of puberty to old age, and these contractions operate in the control, of the caliber of the blood vessels and in propelling the blood through the uterus. During this time and within physiological limits, the musculature is competent to perform its function. Within normal limits, there is a certain definite relation between the caliber of the blood-vessels on the one hand and the musculature on the other.

In infancy and early childhood the blood-vessels are small and the musculature is undeveloped; in old age the caliber of the blood vessels is restricted and there exists corresponding atony of the musculature; while in the period of sexual maturity, both blood vessels and musculature are fully developed. Hence the general rule that the development of the blood vessels and musculature go hand in hand. The usual senile changes in the

uterus are partial atrophy of the muscle fibers, increase in the amount of connective tissue, and a corresponding narrowing of the lumen of the blood vessels. With the advent of these anatomical changes, the menses begin to wane and mark the beginning of the menopause.

Were the blood-vessels to retain their normal caliber in the presence of muscular insufficiency of the uterus, the result would be passive congestion of the uterus and the menses would be prolonged. The explanation lies in a lack of support to the blood vessels, hence engorgement follows.

The term "muscular insufficiency" is a relative one. Where the blood pressure is great, a well-developed musculature may be incompetent in preventing engorgement of the uterus, and on the other hand, where the blood pressure is low, an undeveloped musculature may be adequate.

That the musculature exercises a controlling influence over the blood-vessels is demonstrated by curettage and by what we know of the menstruating and puerperal uterus.

In curettage, after measuring the depth of the uterus with the sound, and dilating the cervix, I have repeatedly noted the uterus relax under the irritating influence of the curette. In several cases so great has been this relaxation of the uterus I have feared that I had perforated the uterine wall, but on careful manipulation of the curette, the depth of the uterine cavity was found increased in all directions. This phenomenon I have observed particularly in post abortion cases. After the curettment, and while the uterus is bleeding freely, if the uterus is irrigated with a hot solution or is swabbed out with an irritating substance, such as formalin, it contracts firmly and the bleeding is instantly checked. The hemostasis could only be ascribed to the uterine contractions.

During menstruation the uterus is soft and relaxed and the cavity is deepened. With the cessation of the menstrual flow, the uterus is contracted and firm. That hemorrhage is controlled in the puerperal uterus by uterine contractions is generally recognized.

If the uterine musculature exercises such a direct and evident influence upon its blood vessels in the instances above cited, we may fairly assume that any event which will result in a lowering of the muscular tone of the uterus may occasion an abnormal loss of blood; providing the capacity of the blood vessels is not diminished through thickening

of their walls and the blood pressure is not correspondingly lowered.

I have repeatedly observed prolonged menstrual periods in the course of anemia and for one or more periods following an acute febrile disease The explanation lies in degeneration of the musculature. The post-mortem findings in the case of a girl 13 years of age, who died of a primary anemia, and who for a year preceding her death had lost fully double the normal amount of menstrual blood, will serve as a type of this class of cases. The uterus was pale, soft and flabby. Microscopic examination revealed a marked atrophy of the muscle fibers and no apparent change in the endometrium or blood vessels. Identical changes were observed in three cases in which death followed the course of prolonged febrile disease and in which the menses were excessive. In these cases no other explanation for the uterine hemorrhage could be given than that of muscular atony.

A far more common cause of muscular insufficiency is found in the building up of connective tissue in the uterine wall, at the expense of the muscle fibers. Of the conditions which lead to fibrosis uteri, by far the most important in point of frequency is passive congestion of the uterus from various causes, such as an incompetent heart, obstructions in the lungs, liver, spleen, kidney, abdominal swellings, chronic constipation, tight lacing and varicose veins of the pelvis. Excessive venery, high living and alcoholism are said to bring about similar changes. Likewise inflammatory lesions about the uterus but not including the uterus will lead to a passive engorgement of the uterus with subsequent hyperplasia of the connective tissue.

In subinvolution of the uterus the muscular activity is impaired, thus leading to venous congestion, and finally to an excess of newly formed connective tissue. In such cases abnormal hemorrhages are of common occurrence.

Similar changes may occur in the endometrium, giving rise to what commonly passes for a hypertrophic endometritis, though having no relation to infection. At all events, the lesion is essentially that of a primary chronic metritis, with secondary changes in the endometrium.

I will here only refer to the theory of Börner, who suggests that vasomotor disturbances account for many of these cases, and compares them with those which bring about nosebleed and the "rushing of the blood to the head." Such an explanation will hardly hold good in hemorrhages lasting hours, days

and weeks. Brennecke has coined the term "endometritis ovarialis," and advances the hypothesis that ovarian irritation causes certain inflammatory changes in the endometrium.

Much has been written of arteriosclerosis of the uterus in explanation of the so-called "essential" or "idiopathic" hemorrages which occur in advanced years. The tendency of the later writers is to ignore the influence of the impaired musculature in bringing about these hemorrhages, and to place the whole responsibility upon the blood vessels.

In reviewing the recorded cases of arteriosclerosis of the uterus, in which hemorrhages were attributed to the sclerosed arteries, I note that in nearly all cases fibrosis of the myometrium and a corresponding atrophy of the musculature is observed, but rarely are these changes regarded as of etiological moment. In almost all cases it is expressly stated that the lumina of the arteries are not encroached upon by a thickened intima, but that the increase in the thickness of the vessel walls is limited to the tunica media and adventitia, a process wholly different from the arterioobliterans of the normal senile uterus.

It will appear that these changes in the vessel walls are secondary to the fibrosis of the uterine musculature. That the loss of the elasticity of the vessel walls contributes to the venous congestion and capillary hemorrhages is granted, but the evidence is wanting to support assertions made that the hemorrhages come from the sclerosed vessels. *Nowhere is it recorded that rupture of the arteries was seen, or that there were aneurisms of the sclerosed vessels. The escaped blood was found farthest removed from the thickened blood vessels and was evidently capillary.*

A brief review of the literature on arteriosclerosis will substantiate these views.

Simmonds says arteriosclerosis of the uterus is common after 40 years of age. Scanzoni regards senile rigidity and friability of the uterine arteries as a factor in uterine hemorrhages in that they do not withstand the blood pressure.

Pechwin and Petit and Marchese each report a case in which the uterus was enlarged and the vessels thickened and convoluted. Cholmogoroff reported two such cases.

Herman suggests that the hemorrhages from the uterus occurring without evidences of pregnancy or new growths are probably due to diseases of the blood vessels. In support of this view he cites hemorrhages occurring near the time of

the menopause when the uterus is undergoing retrogressive changes, in the absence of local findings to account for the hemorrhages, and in the transitory success of local treatment.

Küstner reported a case of postpartum hemorrhage which he ascribed to arteriosclerosis of the terine artery. The patient was 36 years of age, I-para. Death occurred four hours after the birth of the child, notwithstanding the fact of the uterus being firmly contracted.

S. Pozzi observed seven cases of uterine hemorrhage in the past sixteen years for which the cause could not be determined. In all these cases the usual methods of controlling hemorrhage failed and hysterectomy was resorted to. In two of the seven cases there was found arteriosclerosis of the uterine arteries together with atrophy of the muscle fibers and hyperplasia of the connective tissue of the uterine wall.

In the summer of 1896 Reinecke observed four cases of arteriosclerosis of the uterine arteries in the clinic of Leopold, of Dresden. From his experience he infers that these cases are commonly overlooked—a fact to account for the scarcity of the literature. Following are abstracts of the cases:

Case I.—Mrs. ——, 40 years of age, married eighteen years; VIII-para; last birth in 1892, from which time she suffered from a menstrual hemorrhage, each month, lasting eight to fourteen days. When admitted to the clinic in 1896 she was anemic and languid. The uterus was large and retroflexed; introduction of the sound caused profuse hemorrhage. The cervical canal was dilated with laminaria tents, and the uterine cavity palpated. Nothing abnormal was found. The uterus was curetted, with negative findings in the scrapings. Four weeks later the hemorrhage returned, and a vaginal hysterectomy was performed. The uterus was $9\frac{1}{2} \times 6 \times 4\frac{1}{2}$ centimeters, the cervix 3 centimeters long; serosa smooth; muscularis in fundus 2 centimeters thick and of dense consistence; vessels on cut surface of the uterine body prominent. Microscopic findings: mucosa intact, variable in thickness, glands normal, interglandular connective tissues rich in cellular elements, and the blood capillaries engorged. The mucosa was sharply limited from the musculature. In the musculature the vessels were greatly convoluted, and because of these convolutions they appeared on cross-section to be arranged in groups. There was an enormous thickening of the tunica media and, to a lesser degree, of the tunica adventitia. The intima suffered

no change. There was also a thickening of the adventitious coat of the veins. The vessels were engorged with blood. A hyperplasia of the uterine connective tissue accounted in large part for the increase in the size of the uterus. There was some atrophy and fatty degeneration of the muscle cells.

Case II.—Mrs. ——, aged 45, IV-para, last birth in 1890, was admitted to the hospital in 1896. For a period of one year prior to her admission to the hospital she had suffered from menorrhagia and had become anemic and nervous. The uterus was much enlarged and anteverted, the cervix hypertrophied, and the uterine body of dense consistency. All attempts to control the hemorrhage failed. Curettage only temporarily checked the bleeding. A vaginal hysterectomy was performed. The uterine cavity was found filled with a bloody secretion. The endometrium was 2 centimeters thick and sharply limited from the musculature; the glands were normal, and the interglandular connective tissue infiltrated with small cells. In the musculature the blood vessels were prominent, the walls thick and inelastic. The increase in thickness of the vessel walls largely affected the tunica media and to a less extent the adventitia; the intima was unchanged. Degenerative and inflammatory changes were seldom observed in the vessel walls.

Case III.—Mrs. ——, 43 years of age, married six years, entered the clinic in 1896. Up to 1894 the menstrual periods were regular, lasting three to four days. Then they became irregular, lasting three to four weeks, and followed by a watery, odorless discharge. The uterus was enlarged, anteverted, freely movable, and not sensitive to pressure. All the usual means employed in controlling hemorrhage failed; curettage only temporarily checked the bleeding. A vaginal hysterectomy was performed, leaving the tubes and ovaries, which were normal. The uterus was $9\frac{1}{2} = 5\frac{1}{2} = 4\frac{1}{2}$ centimeters; the cervix $3\frac{1}{2}$ centimeters long. The serosa was smooth and studded with thick-walled vessels which gaped from the cut surface. The mucosa, 1 millimeter thick, was covered with a bloody secretion. The microscopic findings were those of a small-cell infiltration of the interglandular connective tissue; the glands were normal, so also were the small arteries of the endometrium; but the large vessels were greatly thickened, the thickening confined to the tunica media and to a lesser extent to the adventitia. The changes in the vessels of the cervix were more extensive than in

the corpus. There was beginning atrophy and degeneration of the musculature.

Case IV.—Mrs. ——, aged 45, married twenty-four years; menses began at 17 years of age and were of the twenty-one-day type, lasting three days. There were two abortions and twelve spontaneous births, the last in 1894. In February, 1896, she had her last normal menstrual period. The menses then stopped for five weeks, reappeared, and continued for fourteen days; then came another pause of fourteen days, and this in turn was followed by a continued hemorrhage lasting three weeks, to be followed by another pause of four weeks; and from that time she continued to flow until operated upon in July, 1896. An exploratory curettage was made, with negative findings, and followed by a vaginal hysterectomy. The microscopic findings were those of acute interstitial endometritis. The capillaries and small arteries showed no appreciable thickening, but the larger vessels were greatly thickened in all three coats of the vessel wall.

"Apoplexia Uteri" is an ill-conceived term first applied by Cruveilhier to a condition of the uterus characterized by a hemorrhagic infiltration of the endometrium together with arteriosclerosis of the uterine arteries. Later Rokitansky, Klob, Von Kahlden, Herxheimer, Popoff, Dittrich, and others have written on the subject. Dittrich reports two cases of so-called "apoplexia uteri." The ages were 65 and 68 years; both were multiparæ; one died of chronic emphysema of the lungs, the other of croupous pneumonia. Dittrich gives a meager report of the anatomical findings in his cases and does not attempt to explain the cause of the hemorrhage into the uterine tissue. Orth adds a report of a single case. The term "apoplexia uteri" is referred to by Fritsch in writing of "secondary hemorrhagic endometritis."

The first case of "apoplexia uteri" to be reported in detail was that of Herxheimer. The case occurred in the service of Prof. Weigert, of Frankfort-on-Main. The patient was 52 years of age and died in May, 1895. The post-mortem findings were as follows: Chronic hemorrhagic nephritis (granular type); hypertrophy of the whole heart; thrombus of the left ventricle and right auricle; slight atheroma of the aorta; multiple pulmonary infarcts; hemorrhagic pneumonia of the right lung; hemorrhages into the internal layer of the dura mater; embolic plugging of the right hypogastric artery; infarction

with gangrene of the vagina, portio vaginalis, lower portion of the rectum, bladder, perineum, and pouch of Douglas; a general suppurative peritonitis; retinitis hemorrhagica and general edema. The primary lesion was in the kidney. The immediate cause of death was peritonitis. Nothing abnormal was to be seen in the body of the uterus, in the tubes or ovaries. The portio vaginalis was of a dark-red color and swollen.

To account for the hemorrhagic infiltration and gangrene of the above-named structures there was found an occlusion of both hypogastric arteries, together with the uterine and vaginal arteries, the external and middle hemorrhoidal, and the perineal arteries of the left side; and on the right side the common iliac and external iliac arteries.

The case reported by Popoff, of St. Petersburg, was found in the pathological institute of Chiari in Prag. The author begins his report by stating that he is not dealing with a simple case of chronic metritis, but with a hemorrhagic infarction analogous to infarcts of the lungs, spleen, and kidneys; that the condition is not to be confused with hemorrhages into the uterine tissue as the result of infectious diseases and heart lesions. The following history is given by Popoff:

The patient was 40 years of age when she was admitted to Prof. Knoll's clinic in Prag, November 2, 1892. She had borne four children. Ten years before her admission to the clinic she had an attack of pneumonia. The menstrual periods were usually painful and the flow excessive. She became paralyzed in the left side, including the face, upper and lower extremities. The heart action was arythmic, the area of heart dullness somewhat increased. The clinical diagnosis was embolic infarction of the fossa Sylvii, hemoplegia, and myocarditis. Death from heart failure occurred in January, 1893. The post-mortem findings were: an old thrombus in the right Sylvian fossa, softening of the cortex about the Sylvian fossa, a serous exudate in both pleural cavities, multiple hemorrhagic infarcts of the lungs, the heart enlarged through hypertrophy of the right auricle and ventricle, both auricles filled with pale thrombi; the liver and spleen congested, the kidney granular; the uterus of dense consistency, 8 centimeters long, 4 centimeters wide at the fundus. The portio vaginalis was dark reddish-brown and swollen. On the posterior wall of the cervix the infiltrated blood extended to the internal os; on the anterior wall of the cervix to a point midway between the internal and external os. Furthermore the

hemorrhage extended deeper into the musculature of the cervix in the posterior wall. Both uterine arteries at the point of bending upward on the uterine wall were completely occluded by thrombi. The tubes and ovaries, as well as the body of the uterus, were apparently in a normal condition. There was marked endarteritis in the vessels of the uterus, and calcareous degeneration of the vessel walls was more or less in evidence. In both arteries and veins of the cervix were thrombi in various stages of development, some lately organized, others in the advanced stage of canalization. The darkened color of the cervical wall proved to be due to a fresh hemorrhagic infiltration. The blood elements were well preserved and the vessels engorged with blood. Glands were compressed by the infiltrated blood, their lumen almost obliterated, and the secreting epithelium desquamated and degenerated. Popoff observed that the infarct took the annular form rather than the typical wedge shape, because of the circular distribution of the vessels in the cervix. Popoff concluded his report with the following deductions:

1. Hemorrhagic infarction of the uterus is a rare occurrence, and can follow either an embolic or thrombotic closure of the uterine vessels.

2. It is essential that the closure of the vessels should be rapid, bilateral, and simultaneous.

3. The postpartum changes in the uterine vessels, especially in the cervix, may underly the formation of hemorrhagic infarcts.

4. The annular form of the infarcts has its origin in the circular arrangement of the blood vessels.

C. von Kahlden has contributed an excellent monograph on the subject of so-called "apoplexia uteri." His observations began in 1892, and in the following six years he collected eight cases for anatomical study. From his experience he affirms that the lesion is of more frequent occurrence than is to be inferred from the scarcity of the literature. His eight cases, briefly recorded, are as follows:

Case I.—75 years of age, multipara; cause of death, pneumonia of the right lower lobe. The heart was soft, but there was no special lesion. The uterus was enlarged, filled with a yellowish fluid, and the endometrium filled with deeply infiltrated blood. The cervix was normal.

Case II.—75 years of age, multipara. Post-mortem findings: endocarditis with mitral insufficiency; thrombosis of pul-

monary arteries; multiple infarcts of the lungs; double-sided, diffuse bronchitis; a bloody secretion in the uterine cavity, the endometrium of the corpus infiltrated with blood, the cervical mucosa pale and smooth.

Case III.—83 years of age, multipara. Senile changes were found in all the organs of the body; the uterus normal in size, the endometrium of the corpus infiltrated with blood, the cervical endometrium unchanged. There were thrombosed vessels on the posterior surface of the corpus and cervix.

Case IV.—87 years of age, number of childbirths not known. Anatomical findings: croupous pneumonia, high-grade atheroma of the aorta, dissecting aneurism of the abdominal aorta; isolated areas of hemorrhage in the endometrium, the cervix normal.

Case V.—75 years of age, multipara; cause of death, pulmonary emphysema and bronchitis. The uterus not enlarged; the endometrium of a diffuse dark-red color, the cervix normal.

Case VI.—76 years of age, record of births not given. Anatomical findings: pulmonary emphysema, bronchitis, pancreatic cyst, atheroma of the vessels near the pancreas, uterus slightly enlarged, endometrium dark red, the cervix normal.

Case VII.—66 years of age, multipara. Anatomical findings: fatty heart, apoplexia of the brain, pulmonary emphysema, hemorrhagic areas in the endometrium with normal tissues intervening, cervical mucosa pale and smooth.

Case VIII.—52 years of age, multipara. Anatomical findings: allstones, cancer of the gall bladder, metastatic growths in the lungs and liver, atrophy of the heart, slight atheroma of the aorta, endometrium infiltrated with blood, cervix normal.

In all cases the endometrium was infiltrated with blood of a dark-red color, the infiltration extending a variable depth into the endometrium and myometrium; in one of the cases was the cervical mucosa infiltrated with blood. In the majority of cases no blood was found in the uterine cavity. The uterus varied little from the normal in size. Groups of vessels with thick walls, containing calcareous deposits, were seen in the outer half of the uterine wall. These deposis were segmentary, semilunar or annular in form, and were largely confined to the tunica media of the vessel wall, rarely i volving the tunica intima. The muscle fibers of the uterine wall were atrophic and in great part substituted by connective tissue. Von Kahlden mentions as predisposing causes: pregnancy, involution, puerperal and non-puerperal infections. He is not

inclined to the belief that the hemorrhage is due to the rupture of the sclerosed vessels, as suggested by Cruveilhier and Klob, because the hemorrhages are confined to the endometrium and the inner half of the myometrium, while the sclerosed vessels are found in the outer half of the myometrium. Then, too, the cervical arteries are sclerosed and there are no hemorrhages into the cervical tissue.

Von Kahlden is of the opinion that the infiltrating character of the hemorrhage suggests the immediate cause to be a return flow from the veins due to an obstruction to the venous circulation. This is shown in the marked engorgement of the veins adjacent to the sclerosed arteries. Doubtless the presence of calcareous deposits in the arterial walls is a factor in the causation of the hemorrhage, in that such vessels are incapable of propelling the blood as do normal elastic arteries. In the eight cases reported by Von Kahlden the infarcation was confined to the body of the uterus and was not present in the cervix; and it was observed that the arteries of the cervix were sclerosed and the lumen narrowed to as high a degree as were the arteries of the corpus; but with a single exception the calcareous deposits were confined to the arteries of the corpus, and in this exception there was a marked passive congestion of the cervix. This speaks for the rôle calcareous deposits in the vessel walls play in the formation of hemorrhagic infarcts of the uterus. Granular and hyaline degeneration often preceded the calcification of the vessel walls in the cases of Von Kahlden, and the calcareous deposits were in large part limited to the inner two-thirds of the muscularis, occasionally spreading into the intima. The intima may be ten times its normal thickness.

I have the following cases to report:

Case I.—Mrs. D., aged 38, American. Entered the Presbyterian Hospital of Chicago, March 23, 1903, in the service of Dr. Clarence Webster. Her general health had always been poor. Her chief complaints were those of general nervousness, headache and painful menstruation. There was an occasional slight leucorrhea, and from time to time she suffered from a bearing down sensation in the pelvis and back. The menses were normal in quantity and in the time of their appearance. She had measles in childhood and pneumonia at 18 years of age. The family history was negative.

She was operated on by Dr. Webster on the day following her admission to the hospital. Four subperitoneal fibroids were re-

moved, an hypertrophied cervix was amputated and the uterus curetted. The uterus was suspended to the abdominal wall to correct a retrodisplacement.

Twenty-six months later she returned to the hospital, still complaining of general nervousness, headache and pain in the eyes. Her menstrual periods were normal until six months ago, when she bled continuously for one month. She was then curetted, and the flow ceased for two months, with the exception of the usual menstrual flow. Then she again lost blood, this time for three weeks. Again she was curetted and this checked the flow for four weeks, when she again flowed three weeks. Another curettage checked the flow for five weeks, and now at the time of her second admission to the hospital she had flowed continuously for a month. During the past month she lost ten pounds in weight.

Dr. Webster then performed vaginal hysterectomy. The removed uterus measured $9 \times 5\frac{1}{4} \times 4\frac{1}{2}$ centimeters; the cervix was 3 centimeters long. The serous surface was smooth with the exception of a subserous fibroid the size of a pea. The wall of the uterus was unusually firm in consistency and on cross-section the open mouths of blood vessels were prominent. The mucosa was 1 m.m. thick and congested. The cervical mucosa appeared perfectly normal.

Microscopic examination of the body of the uterus in various parts showed a normal glandular structure in the endometrium, with hemorrhagic infiltration of the intraglandular connective tissue spaces.

In the wall of the uterus there was a preponderance of connective tissue at the expense of the muscle fibers. The walls of the blood vessels were greatly thickened, this thickening being largely confined to the media and adventitious coats. Rarely was the intima thickened. The lumena of most of the vessels were not diminished and were filled with blood. There were no calcareous deposits in the walls of the blood vessels.

Case II.—Fig. 1. represents a section taken from the uterus removed from a woman 64 years of age, who had passed the menopause twenty-two years, and for the past six years had suffered from great difficulty in urinating, backache and leucorrhea. The uterus was prolapsed. A vaginal hysterectomy was performed by Dr. Webster. The uterus measured $8 \times 4\frac{1}{2} \times 3$ c.m. and was very firm in consistency. The cervix was proportionately large and the os patulous to the index finger. Micro-

scopic sections showan atrophic endometrium, the musculature is scant and the connective tissue markedly increased. The vessel walls of the body of the uterus are greatly thickened in all three oats and the clumen of the blood vessels encroached upon by the thickened intima, and in many instances the lumen is completely obliterated. No blood is seen to have escaped into the tissues of the uterus.

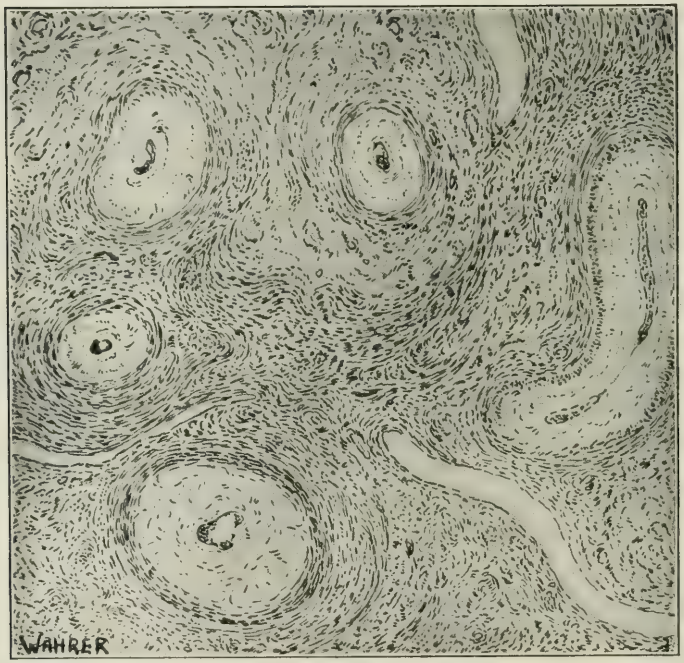


Fig. 1.—Obliterating arteritis in a normal senile uterus. all three coats of the vessel walls are thickened and the lumrea of the vessels are almost wholly obliterated. There is marked atrophy of the muscle fibers and hyperplasia of the connective tissue in the uterine wall. No hemorrhages occurred.

Comparing sections from this uterus with those taken from the cases in which bleeding occurred, we find about the same degree of muscular insufficiency and hyperplasia of connective tissue in the uterine wall. The essential difference lies in the partial and complete obliteration of the vessels in the case in which no hemorrhage occurred, and in the patency of the blood vessels in the cases in which hemorrhages occurred.

Mrs. T., aged 41, II.-para, one abortion ten years ago. The menses were regular in time and amount from the time of puberty at 14 years of age till two years ago, at the age of 39. At this time the flow increased in quantity and later in frequency, until at the time of her admission to the hospital, she menstruated every three weeks for ten days. Blood examination showed 50 per cent. of hemoglobin, 2,500,000 reds and 6,500 whites.

During the previous two years three curettments were performed for the control of the bleeding, but with only temporary results. Rest in bed and ergot gave no permanent relief. Physical examination revealed no apparent cause for the loss of blood, but because of the repeated failures in controlling the bleeding and the increasing anemia and general weakness, hysterectomy was resorted to.

The uterus was normal in outline and size, but unusually firm. Hemorrhagic areas were present in the mucosa, but there was no thickening or irregularities in the endometrium. The blood vessels were prominent in the wall of the uterus. The cervix did not differ from the normal.

Microscopic examination showed a bloody infiltration in the interglandular spaces of the endometrium. The connective tissue was everywhere increased, both in the mucosa and muscular wall of the corpus. The muscular fibers were relatively scant. The blood vessels were numerous and thick-walled, particularly in the outer half of the wall. The increase in thickness was largely confined to the media and adventitia of the arteries; the intima showed little or no change from the normal, and the lumen of the vessels was not altered. Nowhere were hemorrhages seen as the result of ruptured vessel walls, nor were aneurysms of the vessel walls seen.

Case II.—Through the courtesy of Dr. Bertha Van Hoosen, I am privileged to report the following interesting case: Mrs. B., age 55, married 33 years. Nativity English. Has given birth to twelve full-term babies and has had two miscarriages with no unfavorable results. Patient has never had an acute illness, but for some years she has suffered from an incompetent heart and chronic nephritis. She began menstruating at 14 years of age, was always regular in time and the flow was scanty. She came naturally into the menopause ten years ago and for nine years there was no sign of a bloody uterine discharge. During the past year she has experienced an almost constant discharge from the uterus, which was blood tinged. At the end of this time

she was curetted by Dr. Van Hoosen, who suspected a carcinoma of the uterus. Nothing was scraped away. A section was taken from the cervix and examined microscopically with negative results. In two weeks the bloody discharge reappeared and continued for four weeks, at the end of which time a vaginal hysterectomy was performed by Dr. Van Hoosen.

Much difficulty was experienced in removing the uterus per vaginum, because the uterine musculature was so soft and flabby, and furthermore, the vessels in the upper portion of the broad ligament were found so large and friable that it was deemed advisable to secure them with an unusual number of ligatures.

The removed uterus was found to be unusually soft, the walls were thin and the uterine cavity about three inches in depth. The blood vessels in the fundus were prominent.

Microscopic examination of the uterine wall revealed almost a total absence of endometrium through senile changes. There was everywhere very much decrease in the muscular elements of the uterine wall and an unusual amount of connective tissue, which stained poorly. Here and there were seen areas of escaped blood, but only in the inner zone of the uterine wall, far removed from the large blood vessels. The walls of the blood vessels were greatly thickened. Some of the vessels were almost occluded by thickening of all three coats of the vessel wall, but as a rule there was but moderate thickening of the intima and a very great increase in the media and adventitia. In the media there was seen in a few of the blood vessels calcareous deposit forming either a complete annular ring or distributed in segments. These calcareous deposits were confined to the larger vessels in the outer zone. The veins were engorged with blood and their walls slightly thickened.

It is of interest to note that the ovarian vessels were calcareous and very large, while the uterine vessels could not be detected when tying off the broad ligaments.

In reviewing the points of special interest in this case, it is observed that the incompetency of the heart and the pronounced symptoms of chronic nephritis were soon followed by a bloody uterine discharge, and this after nine years of a normal menopause. Undoubtedly the muscular atrophy and the arteriosclerosis of the uterus were in existence long before the appearance of the uterine hemorrhage. The loss of elasticity of the vessel walls and the weakened support to the vessel walls from muscular atrophy would not in themselves have caused the

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FIG. 1.



FIG. 2.

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Fig. 1.—Vessel wall magnified 265x, showing great increase in the tunica media and adventitia and no change in the tunica intima. The lumen is not narrowed. In the tunica media is a semilunar shaped calcareous deposit.

Fig. 2.—The vessel walls are thickened but the lumena are not encroached upon: the thickening is confined to the tunica media and adventitia. Some of the vessel walls contain calcareous deposits. The blood vessels are engorged with blood and the inner half of the musculature is irregularly infiltrated with blood. There is marked muscular atrophy and hyperplasia of the connective tissue in the uterine wall. The endometrium was lost through senile changes.

hemorrhage, but were contributing factors when a pelvic congestion was occasioned by the incompetent heart and chronic nephritis.

The case which I reported in my original paper on arteriosclerosis of the uterus was one of so-called "apoplexia uteri" in which the hemorrhagic infarcation was evidently caused by the plugging of the sclerosed uterine arteries with blood clots dislodged from the heart. The specimen, including the uterus and appendages, was given to me as an "arbeit" by Prof. Langerhans, of Berlin. The autopsy was performed the previous month and the specimen preserved in Kaiserling's solution. The general post-mortem findings at the autopsy were carefully recorded, but the clinical history was meager and unsatisfactory. From the clinical history the following facts were learned:

Mrs. ——, 70 years of age, was in good health until five months before her death, when she began to suffer from insufficient heart action and extreme anemia. Fourteen days before her death she was seized with a pain in the right side of the chest, that was immediately followed by spitting of blood and some vomiting. Simultaneous with the onset of the pain in the chest there appeared a pain in the hypogastrium, and this was followed by a slight bloody discharge from the uterus. The patient became very weak, the heart action irregular and feeble, and the respirations rapid, shallow, and labored. The age, anemia, and general weakness, associated with the pain and a bloody discharge from the uterus, suggested the diagnosis of cancer of the body of the uterus. The post-mortem findings, briefly stated, were: endocarditis, dilatation of both ventricles, a large thrombus in both ventricles of the heart, nutmeg liver, a general sclerosis of the arteries of the body, a large hemorrhagic infarct of the right upper lobe of the lung, both uterine arteries calcareous throughout almost their entire extent, and in both uterine arteries a fresh blood clot. On opening the uterine cavity a small quantity of bloody secretion was found, and the endometrium was of a diffuse, dark-red color; the cervical mucosa was apparently normal. On the cut surface of the corpus the blood vessels stood out prominently, the lumina gaping and the walls thick and calcareous. Numerous small blood extravasations were seen in the uterine wall, giving a mottled red and gray appearance. The ovarian arteries were likewise calcareous. Hemorrhagic spots were seen in the cut surface of the ovaries and in the fimbriæ of the

tubes; they were normal in size. No blood clot was found in the ovarian arteries, but the lumen was greatly narrowed. The uterus measured $8\frac{3}{4} \times 5 \times 4\frac{1}{2}$ centimetres; the cervix, $2\frac{1}{2}$ centimeters; the musculature in the fundus was 2 centimeters thick and of firm consistence; the serosa smooth. No record was made of the condition of the other arteries of the abdomen and pelvis. Miscroscopic sections of the uterine wall showed an intense blood infiltration of the endometrium and, to a variable depth, of the uterine wall. Very little of the endometrium could be seen; here and there sections of glands were seen compressed by the effused blood in such a manner as to appear like epithelial nests, which in scrapings might be mistaken for cancer. The vessels of the musculature were engorged with blood, and isolated areas of diffused blood were seen in the uterine wall almost to the serous surface. *The muscle cells were atrophied and largely replaced by connective tissue which stained faintly.* Because of the convolutions of the arteries they appeared on cross-section to be arranged in groups. The walls were greatly thickened, particularly in the tunica media, but the intima and adventitia shared in the hyperplasia. In some of the vessels calcareous deposits were found, arranged in a crescentic, annular, and segmentary manner. These were largely confined to the media, but in some fields the intima was also involved. So far as observed, these deposits did not extend within the outer half of the musculature, though the thick-walled vessels were found even to the surface of the endometrium. The veins were engorged with blood and the walls somewhat thickened. The cervical arteries were thick-walled, the lumina restricted, but no calcareous deposits were seen.

The finding of arteriosclerosis and calcareous degeneration in the uterine arteries of a woman of 70 years is just what should be expected, particularly when the peripheral arteries are similarly affected. The case was not recorded because the writer believed arteriosclerosis to be a rarity, but rather to call attention to the lesion in the hope that it will be more generally recognized. The case does, however, claim peculiar distinction in the occurrence of thrombosis of the uterine arteries with the resulting hemorrhagic infarction. Doubtless the pain in the hypogastrium occurred at the time of the plugging of the uterine arteries with a blood clot, which in all likelihood had been dislodged from the heart thrombi. I take it that from the thrombus in the left ventricle the infarction of the



ARTERIO-SCLEROSIS AND CALCIFICATION OF THE UTERINE ARTERIES. FINDLEY.

M. Musculature.
E. Endometrium with effused blood.
C. Calcareous deposits in vessel wall.
CA. Congested vessels.

uterus occurred, and from the thrombus in the right ventricle the infarction of the lung occurred, and that the plugging of the uterine and pulmonary arteries occurred simultaneously, as evidenced by the pain in the chest followed by spitting of blood, and the pain in the uterus followed by a bloody discharge from the uterus. It is not surprising that the clinical picture of pain in the hypogastrium, uterine hemorrhage, anemia and extreme weakness in a woman of 70 years should be mistaken for cancer of the uterus. In such a case the possibility of cancer could only have been excluded by exploratory curettage; and in this case the condition of the patient would not justify the procedure.

In the so-called "apoplexia uteri" it is probable that the hemorrhages are not caused by the rupture of the blood vessels, but are rather due to capillary oozing. This would account for the hemorrhagic infiltration being so removed from the sclerosed vessels in the cases of Von Kahlden. The loss of elasticity of the vessel walls, the fibrosis of the uterine musculature and the thrombosis are all contributory factors to the hemorrhages into the uterine tissue and cavity.

As to the diagnosis, we are usually content to call such cases endometritis when there is no demonstrable cause for the hemorrhage. If an exploratory curettage is made with negative findings, the diagnosis of metritis will probably be given, and particularly when the uterus is of dense consistency and uniformly increased in size. The clinical diagnosis is at best uncertain, and can only be arrived at by excluding all such causes of hemorrhage as polyps, carcinoma and fibroids. If hemorrhages occur and there can be found no local cause either in the presence of new growths in the uterus and adnexaa or in the microscopic examination of uterine scrapings, then it is fair to presume that chronic metritis, with or without arteriosclerosis of the uterine vessels exists. If in addition to this there is found arteriosclerosis of the peripheral arteries of the body, and there exists a disease of the viscera to account for an obstruction in the return circulation from the pelvis, then it is further fair to presume that a hemorrhagic infarction of the uterus is present and that the uterine hemorrhages are due to a hemorrhage into the tissues and cavity of the uterus as the result of muscular insufficiency. It is not probable that the sclerosed vessels will be found in the scrapings, because they commonly lie in the outer half of the uterine musculature. Caution must be exercised in the liability of mistaking the compressed glands for cancer nests.

If the endometrium is found hypertrophied, it is not to be assumed that the lesion is primarily an infection of the endometrium with extension to the uterine wall. In the absence of a history of uterine infection, it may well be assumed that the primary lesion rests in the musculature, and that the endometrium suffers the same changes as the muscular wall of the uterus as the result of passive congestion.

The treatment may be briefly outlined. Therapy resolves itself into control of the hemorrhages. The therapeutic procedures will be largely governed by the social condition of the patient. If she is dependent upon her labor for a livelihood and the hemorrhages are such as to reduce her strength, then vaginal hysterectomy will be indicated, as in the four cases of Leopold reported by Reinecke, the seven cases of Pozzi and in three of the cases here recorded. Where it is possible for the patient to retire from work during the hemorrhages it is well to enjoin rest; to attempt to control the hemorrhages by ergot, the application of styptics to the endometrium and the tamponing of the uterine cavity with iodoform gauze (Duhrssen). If, however, the hemorrhages cannot be controlled in this manner, and the patient's strength is seriously undermined, vaginal hysterectomy must be resorted to. Reinecke writes of a case in which no less than twenty-five curettments were done to control the hemorrhages, without the desired result, and hysterectomy was finally resorted to.

CONCLUSIONS.

1. Metritis as a primary lesion and independent of infection, is not accorded the consideration which the frequency of its occurrence and its clinical significance would warrant.

2. The muscular fibers of the uterine wall have an important function in controlling the caliber of the blood vessels, and hence in regulating the blood supply to the uterus, as evidenced in the relaxed condition of the uterine wall during menstruation, in post-abortive and postpartum hemorrhages, and in the free bleeding which accompanies curettage when the uterus has relaxed under the irritating influence of the curette. In all these conditions the hemorrhages are controlled by the contractions of the uterus.

3. Any event which lowers the muscular tone of the uterus may occasion an abnormal loss of blood into the endometrium and uterine cavity.

4. Prominent among the factors which contribute to muscular atony in the uterus, are the wasting diseases, anemias and acute febrile diseases, which are not infrequently accompanied and followed by uterine hemorrhages as the result of weakened support to the vessel walls from myodegeneration.

5. Fibrosis uteri is a far more common cause of muscular insufficiency. The building up of connective tissue in the uterine wall at the expense of the muscular elements is the result of long-continued passive congestion, which in turn is due to numerous general and local lesions, such as an incompetent heart, obstructions in the lungs, liver, kidney and spleen, abdominal swellings, varicose veins of the pelvis and uterine displacements.

6. The walls of the blood vessels share in these hyperplastic changes, in that the media and adventitious coats of the vessels are thickened. In this manner the elasticity of the vessel walls is impaired, and if the lumen of the vessels is not narrowed by contraction of the vessel walls and thickening of the intima, there will be added reasons for venous engorgement of the uterine wall and capillary oozing into the endometrium. In such cases the prime factor in the causation of uterine hemorrhages is the muscular incompetency; the thickened vessel walls and the remote embarrassments to the circulation are but contributing factors.

7. This condition of the vessel walls is to be distinguished from the arteriooblitérans of the normal senile uterus, in which the vessels are partially or wholly obliterated by the thickened intima and the contraction of the vessel walls. In such cases hemorrhages do not occur for the reason that the blood supply is greatly diminished.

8. In none of the recorded cases were hemorrhages seen to come from ruptured vessel walls, nor were aneurysms of the arteries seen in the uterine wall. On the contrary, the escaped blood was farthest removed from the sclerosed vessels and were evidently capillary. We are therefore not justified in ascribing the hemorrhages directly to the sclerosed vessels.

9. The diagnosis can only be made by first excluding all other possible causes, such as polyps, carcinoma and fibroids.

10. Hysterectomy has been frequently resorted to after repeated curettments have failed. Palliative methods, *i.e.* rest, ergot, styptic applications to the bleeding surface, and finally tamponing the uterine cavity may be resorted to, but have repeatedly failed.

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100 State Street.

RETROVERSION OF THE UTERUS.*

BY

ARTHUR W. JOHNSTONE, M.D.

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The initial factor in this common trouble is a stretching of the uterosacral ligaments. I have listened to the many papers and suggestions that have been made on this floor and read everything

*Read before the Am. Gyn. Soc., May 25, 1905.

that I could lay my hands on about it since 1880, but was never satisfied that I was on the right track to its relief until three years ago, when I first got this idea.

Some ten years since, by the carelessness of a nurse, I was permitted to open the abdomen of a very small girl, whose bladder contained not less than a quart of urine, and for the first time I saw the round ligaments stretched to their utmost limits. The bladder rose up between them, overriding the fundus of the uterus, pushing it backwards, to such an extent, before the catheter was used, that there was almost a retroflexion. Except for being pushed slightly backward the cervix seemed to stay in place, and, in spite of the weight and strain of this distended organ, was firmly held in its natural position by something that seemed to be pulling it up from behind. As the urine ran away through the catheter, I could see the round ligaments acting like "guy ropes" to the top of a crane, pulling the fundus forward, but in no sense lifting it in the least. I held my finger on the back part of the uterus, as the last of the urine was evacuated, and its lower end did not seem to move in any way.

This accident taught me two facts. First, that there is something whose duty it is to pull the lower segment of the uterus upwards and backwards; second, that the round ligaments never lift the uterus in the least, but act as "guy ropes" to prevent the fundus from being pushed back beyond their limits.

Before this incident occurred I had shortened the round ligaments several times, with only partially satisfactory results. Some patients were very much relieved, but others still complained of the old dragging sensations. In the latter class I found that, while the retroversion was relieved more or less, the position of the whole uterus was on a lower plane than natural, and there seemed to be a "prolapse" of all the pelvic viscera.

Having been a civil engineer, I had the principle firmly ground into me that if you want to permanently repair anything you must not only find out just what its injury is, but that you must begin at the starting point of that injury and build up to its end.

Not knowing exactly what this starting point was, and finding no one that could tell me, I confess I have been a sceptical spectator of the many tilts that we have all had about it during the last ten years.

All the artificial attachments of the uterus to places where it does not naturally belong I could not help but scout, for the engi-

neer's reason. To me they were nothing but "make-shifts," many of which left the organ in worse condition than the first. I have never had anything but condemnation for any form of ventral attachment. My reasons for this I stated when I first heard of it, which were that it forms a bridle in the abdomen in which the intestines are liable to become incarcerated, and that it would probably be a fruitful source of distocia in subsequent labors. The reports that we are now getting from it confirm the judgment that I then formed. To say the least of the principles underlying these operations, it is a confession that we do not know what is wrong; and, like primitive man, when dealing with a leaning wall, we are satisfied to put a prop against it instead of digging out the foundations and rebuilding the wall. Attachments to the vagina I dislike for the same reason. They pull three organs, uterus, bladder, and vagina, out of their natural relations and must impede their natural actions just that much.

So, for some years, I got along with an occastonal Alexander, but mainly with pessaries, believing that some day we would work out its true cause.

In 1889, Riddle Goffe gave me an object lesson of what could be done in the pelvic peritoneum through the vagina. From that time on I have been using that route for first one thing and then another until I became much more familiar with it than I formerly thought I ever could be.

With this preparation for what was to follow, some three years ago I began to work over again the comparative anatomy of the pelvis, with special reference to a paper that I was to read in Rome at the last meeting of the International Congress. When I came to the ligaments of the horizontal animal's uterus, I was surprised to find that the sacrouterines were the only ones that seemed to give any support. There was no trouble about finding the round ligaments, but they were such long, thin, trifling affairs that about the only function that I could make out for them was to prevent the two horns of their double uteri from getting together, and thus becoming tangled with each other.

As we all know, the uterus of the horizontal animals lies on an inclined plane with its cervix up. The dip of this plane, composed of bladder and the posterior part of the abdominal wall, is 45°. No matter what position the animal assumes, except standing on her hind feet, this angle is not changed. As the fundus (or rather the cornua) lies at the bottom of this plane, the round ligaments can not pull them in any direction except sideways, and, possibly,

slightly up this plane. This motion can serve but one purpose, and that is to further separate their Y-shaped ends. As these animals are never on their hind feet more than an instant at a time, there can be little or nothing else for the round ligaments to do. When lying down there is a tendency for the upper horn to slide to the lowest side, which movement the round ligament would effectually stop.

The broad ligaments have the same intimate relations with the anterior bones of the pelvis that they have in the erect animal, but as the bladder is behind them, and allowance must be made for it to fill and empty, at their expense, they have to be very long and loose. While they do something to keep the cervix from sliding down this inclined plane, they are so fluffy that they alone could not prevent it. As in the erect animal when "on all fours," Douglas' pouch lies just above the cervix and comes a good ways back along the vagina. But on either side of it, from a strong anchorage to the straight, flat sacrum, come down two large strong uterosacral ligaments that are inserted into the uterus and cellular tissue where the broad ligaments join it at the internal os.

Here, then, is the sling that holds the cervix at the top of its inclined plane, and prevents it from sliding down on its intestine-like body, causing all sorts of torsions and intussusceptions.

When the erect position was assumed, there was no change in the relations of the pelvic viscera, the only alteration being in the curving of the sacrum which gave the uterosacrals a better angle at which to lift the whole weight of the now diminished single uterus. The "sling" type is still retained, but as the single uterus is topheavy, the round ligaments were given more power to hold it forward in its proper place on the bladder, when empty, and to keep it from pushing the uterus too far back when full.

Of course, I have known always, in a general sort of way, that there were such things as the uterosacrals, but this object lesson made me think that at last I had found what held that girl's cervix so securely in position, in spite of the strain of that distended bladder. Here was the solution of the fact that Thomas and Goodell taught me as a student, that most retroversions are preceded more or less by a prolapse. Here is the explanation of the undoubted good that has been done by the Hodge, Smith, Thomas pessary, with its many modifications.

A healthy pair of uterosacrals will stand a great amount of strain, but a slight loss of their tone will at once allow a prolapse to begin. Whereas the Hodge pessary takes the strain off these

ligaments, and if the cause of their softening be removed, they may regain their natural tone. Futher evidence of the truth of this is furnished by the rapid descent of the uterus, after cutting loose the buttons that hold the second set of ligatures when doing a vaginal hysterectomy. These ligaments are generally caught in the loops of the second set of ligatures.

Being sure that the uterosacrals are the starting point of this vicious cycle, the question came of how to get at them. Of course, when this trouble is complicated with bad tubes or anything that requires the abdomen to be opened to save life, it must be done and the ligaments dealt with as the case will permit. But we have found by experience with Alexander's operation there are a large number of cases with this trouble that have no other complication beyond a chronic metritis, which it would be allowing to take an unwarranted risk to have a laparotomy. These are the cases that we have been fighting for so long, in our efforts to find some safe method of relief. By this time some of our fellows had come to about the same conclusions that I had, and every now and then reported cases of the shortening of the uterosacrals by the abdominal route. For the above reasons, I did not like it, and for a year systematically studied every pelvis that I had to invade for any purpose by the vaginal route. From the ordinary drainage incision, even, it is surprising how readily you can make out the insertions of the uterosacrals when you have a mind to. In some dozens of cases, in spite of pathological changes, I found that I could have put a crimp in them if there had been any reason for doing it; but I also found that the transverse cut sometimes goes through these ligaments at their uterine insertion and destroys the landmarks. Being satisfied that I could catch up these ligaments at their insertion into the uterus whenever I wanted to, I decided to take the hardest class of cases first. It would be easy enough to do it through a large multiparous vagina, but as there were liable to be other complications in this class that would need simultaneous repair, and so complicate my results, I decided to try it on virgins first.

So, on November 5, 1903, I operated on the first case. She was 25 years old, of slight build, simple retroversion, and the usual metritis, with symptoms that had lasted for five years. The hymen was intact, and the vagina very small. With small Syms specula, in the dorsal position, I exposed the cervix and caught its posterior lip with a volsella forceps after a thorough curetting. Beginning at the vaginocervical junction at the apex of the pos-

terior fornix, I made a 2-inch incision through the vagina in its long posterior central axis. On breaking through the peritoneum into Douglas' pouch I found the uterosacrals on either side of my finger. Their insertions into the uterus and periuterine tissues were just above and slightly to the side of the upper limit of the incision. From these points each could be traced out on its respective pelvic wall as far as the finger could reach. Picking them up with a long pair of forceps as high as I could get them, they were drawn down into the incision and shortened as much as 2 inches by suturing with catgut. The needle punctures were all inside the peritoneum, and the stitches were not tied until all the threads were in place on both sides. Before drawing them up tight, the cervix, which was still held by the volsella, was pushed back to an exaggeration of its normal position, and held there until the knots were driven home. The incision was then closed with catgut and a salmongut drain put into the uterine cavity. The after treatment was that of any ordinary peritoneal operation, and the convalescence was like that of a trachelorraphy, the temperature never going above 99½.

I had warned the girl that I was experimenting on her and that I might have to shorten the round ligaments, as well; but, to my delight, when I examined her two weeks after the operation, the uterus was, if anything, in antiversion and has stayed so ever since. All her old symptoms have disappeared and she has put on 15 or more pounds, and is attending to her full duties. While 19 months is hardly long enough to say that the ligaments will never stretch again, still it is a pretty good test of its improbability.

I have been rather chary of offering this operation to every patient that came along, before I knew what we could do with it. But last July another girl of 26 got tired of wearing her pessary, which she had not been able to go without for four or five years. Her pessary was of the very smallest size of the Thomas retroversion, and, if anything, her vagina was smaller than the first, but in spite of it I succeeded in doing the same operation with the same results up to the present time, which is now 10 months since the operation. If anything, her improvement has been more marked than the other; for the first time in her life she is becoming positively fat, when, before, she was a little snipe of a woman.

What the ultimate results will show I cannot say, but since there has been no sagging of the uterus in either, I believe that the results will be permanent; for the first step in a retroversion is a coming downward and forward of the cervix. As the metri-

tis is completely cured in both, I cannot see what is to soften the ligaments again. We have all seen cases of retroversion cured by curetting and the wearing of a pessary. What can that mean if it is not the removal of the cause of the softening of the ligaments and allowing them to regain their natural tone?

Neither of these cases had anything done but the curetting and the shortening of the uterosacrals. Had the uterus been large or heavy in either, I would have been tempted to combine the Alexander with it, but as both were ordinary virgin organs, and as I wanted to test the sustaining power of these ligaments, I did nothing else.

Now don't understand me to claim that this is the only operation that should be done for this trouble, for two cases are not enough to settle much, even though they have been watched until all surgical irritation has passed. But they do settle the question that these ligaments can be reached in an easy, safe way, by a well trained man, without the shock incident to the Trendelenburg position, where nothing but inside work can be done.

I believe that we will find it a valuable adjuvant to plastic work, and that it can be done at one sitting with trachelorraphy and perineorraphy, or combined with Alexander, if the organ is very heavy. A little experience with it, and any member of this society can do it in ten or fifteen minutes. But don't think that any "Railroad Surgeon" can do it, as he can the ventral attachments. Most of the work has to be done by touch, and if an untrained man loses his bearings and "goes it blind" in this part of the pelvis he will be tying up the ureter, sticking his needle in the internal illiac vessels, or damaging the rectum before he knows what he is doing. In your hands, though, I know that the operation is safe. My object in bringing it to you so early in my experience with it is to get assistance in thrashing out of the possibilities, and to do what I can in return for the much valuable training I have had at your hands.

The bibliography of this subject you know as well or better than I can tell you in fifteen minutes. So, not being able to go into the full history of our knowledge of the uterosacral ligaments, I have refrained from mentioning the work of any one, and have been satisfied to "tell the tale as it looks to me."

MADISON ROAD.

A CONTRIBUTION TO THE EFFICIENCY OF PLASTIC OPERATIONS IN THE VAGINA.*

BY
BARTON COOKE HIRST, M.D.,
Philadelphia, Pa.

(With six illustrations.)

THE consequences of lacerations of the birth canal in labor constitute the commonest disease of women. In looking over a card catalogue of diseases of women from the writer's services in the University and Howard hospitals and from private prac-

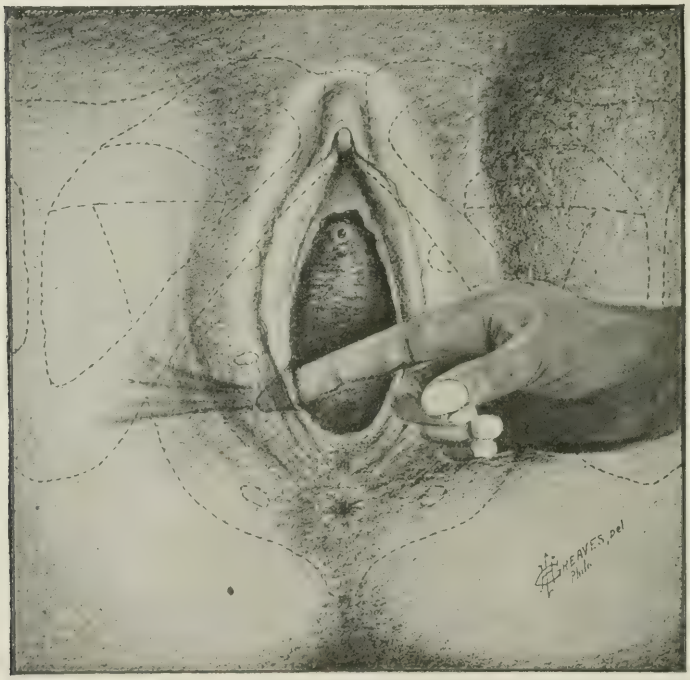


Fig. 1 Palpating the pouch left by the retracted transverse perineal muscle.

tice, a record of 2,372 plastic operations on 1,582 patients was found: 1,358 perineorrhaphies; 303 anterior colporrhapies; 625 operations on the cervix; and 86 operations for total prolapse. A more instructive feature than mere numbers is the fact that the

* Read before the Philadelphia Obstetrical Society, April 6, 1905.

material afforded an opportunity for the study of injuries of the genital canal at all periods from a few minutes after labor to years after the menopause, and that the total is made up of primary, intermediate and secondary operations for all the degrees, varieties and consequences of these lacerations. Such an experience should teach lessons that cannot be learned from secondary

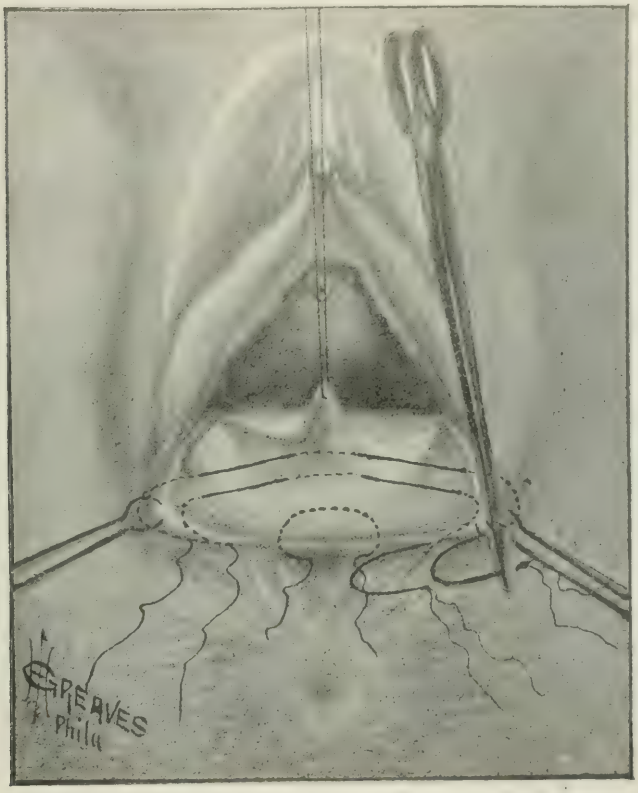


Fig. 2. Insertion of the crown suture so as to insure the penetration of the needle point deep enough to catch the retracted end of the transverse perineal muscle.

operations alone, usually performed years after the original injury.

The following facts appear plainly from this study: A more frequent injury of the pelvic floor than laceration of the levator ani muscle, is a laceration and retraction of the transversus perinei muscle, often associated with injury of the triangular ligament. Laceration of the urogenital diaphragm in the anterior vaginal

sulci is almost as common as laceration of the levator ani muscle and the pelvic diaphragm in the posterior sulci. The levator ani muscle is frequently torn from its attachment to the pubic bone and the arcus tendineus instead of being lacerated in the mid line of a sulcus. All of these injuries can be repaired as well during the puerperium as at any other time if the patient is put on an operating table and a formal plastic operation is performed with sufficient assistance. If the repair of the lacerations in the puer-

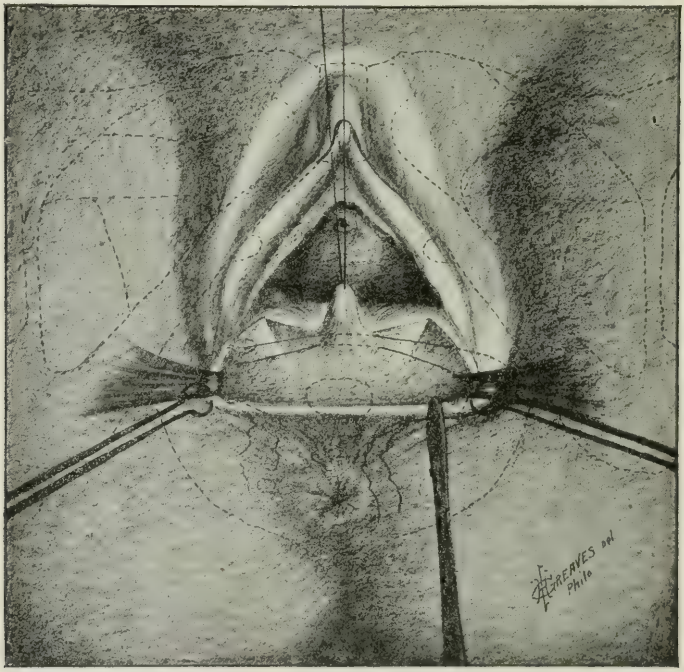


Fig. 3. Perineal sutures inserted so as to catch the retracted ends of the transverse perineal muscles.

perium is neglected, rectocele, cystocele and prolapsus uteri can be more perfectly and permanently corrected than is usually the case by modifications of the ordinary operative technique suggested by a study of the original injury.

It is the purpose of this paper to call attention to a modification of the Emmet operation designed to repair the injury of the transversus perinei muscle and triangular ligament and to a modification of the operation for prolapse, giving the firmest possible support to the anterior vaginal wall. If a routine exam-

ination of all cases is made as represented in Fig. 1, by inserting a forefinger laterally under the skin of the labium majus, above the triangular ligament, within the vaginal introitus, below the lower edge of the levator ani muscle it is surprising to find how often the finger sinks into a deep pocket, frequently reaching to the ischium. If the region is palpated externally it is flabby and relaxed and remains so after ordinary Emmet operation. By palpating with the forefinger inside and the thumb outside, the stump of the retracted transversus perenei

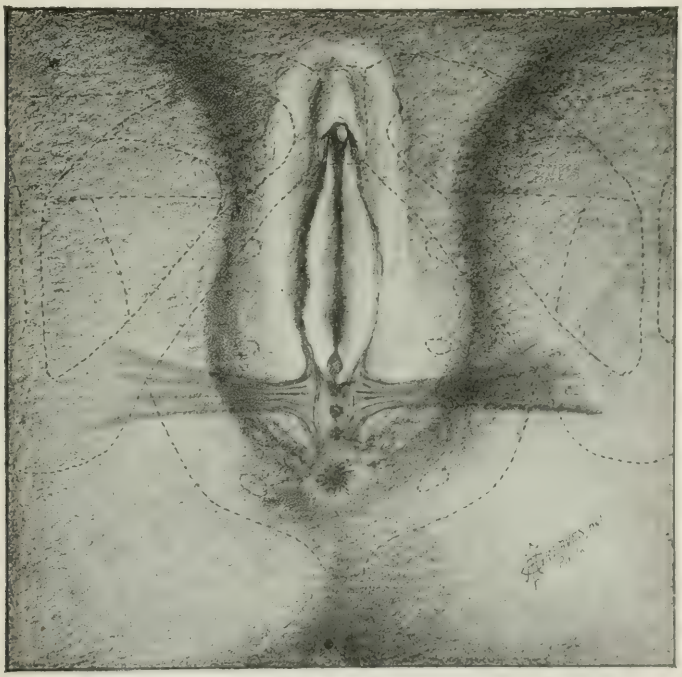


Fig. 4. Muscular and fibrous structures of the perineum united.

muscle is often felt. In a single office hour this condition was demonstrated in two patients operated upon for lacerated perineum by well-known gynecologists who had overlooked it. If the retracted muscle is brought to the median line again and the triangular ligament is restored, a striking difference is observed. A strong musculoligamentous band almost the breadth of two fingers spans the space between the ischia, the posterior commissure of the vulva and the anus. The tone and resistance of the diaphragm of the pelvic outlet is that of a nulliparous woman.

A simple modification of operative technique accomplishes this result. A somewhat wider and deeper denudation is made at the posterior portion of the vulvar orifice than common and a large curved needle is inserted in such a manner as to catch retracted muscular and ligamentous tissue. This can best be done on the left side by a right-handed man by means of a back-handed stroke in inserting the needle. It is often necessary to carry its point almost to the ischium. Then by sweeping the handle of the

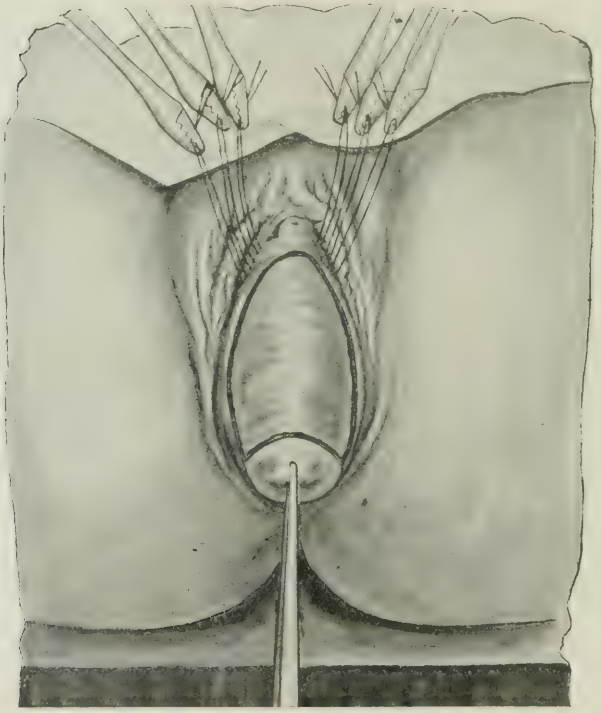


Fig. 5. Denudation of the anterior vaginal wall for prolapse.

needle holder through half a circle, bringing it below the needle instead of above, the suture of silk worm gut is carried as in the ordinary crown stitch of the Emmet operation. On the right side a turn of the wrist secures as deep an insertion and as firm a hold of tissue as necessary.

In prolapse operations, this perfect restoration of the pelvic floor is particularly important, but the commonest defect of such

operations is an imperfect restoration of the anterior vaginal wall. It is mainly on this account that there has been such a discouraging proportion of failures in the statistics of many operators.

The following technique, in the writer's judgment and experience, gives the greatest assurance against a recurrence: The anterior vaginal sulci are denuded as in the writer's operation for

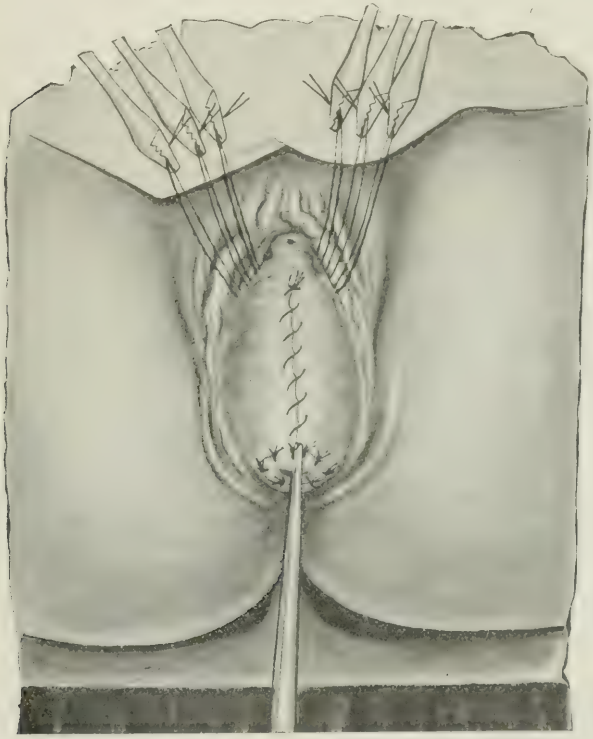


Fig. 6. Raw surfaces covered by a tier suture. Interrupted sutures on the stump of the amputated cervix. The sutures in the anterior sulci are tied after the uterus is replaced.

cystocele. The sutures are inserted but not united; in the grip of hemostats they are laid over the pubis. The cervix is pulled out of the vulva. An inverted shield-shaped area is marked out with a knife, the apex of which is just below the urethra, the base of which is formed by the circular incision around the cervix which precedes its amputation. The whole thickness of the vaginal wall is dissected off within this area. The cervix is

amputated at the level of the internal os in women too old for child-bearing; somewhat lower in younger women. The corners of the vaginal wall left at A and B are dissected loose, permitting access to the strong cardinal ligaments of the uterus in the bases of the broad ligaments. The denuded area on the anterior vaginal wall is united and covered by a tier stitch of catgut in two to four layers, the number of layers depending upon the width of the denudation. The stump of the cervix is covered by the modified Hegar's sutures of catgut, the two lateral sutures on each side taking a firm hold of the fibromuscular structures in the bases of the broad ligament. The shape of the denudation on the anterior wall was suggested by Reynold's operation for cystocele, but the stitches are inserted in a different and, we think, a better way. Formerly the Martin's denudation was employed. It is difficult to trace hospital patients in a shifting population among the poorer classes and it is possible that there may have been failures from this operative technique, but we have been unable to find one.

The posterior vaginal wall and pelvic floor are usually restored by an extensive Hegar's operation, care being taken to repair the diaphragm of the pelvic outlet.

In women of child-bearing age, the uterus is suspended as an additional precaution. This, however, is not so important a step in the operation for prolapse as it is often thought to be. We have seen five cases in which the uterine fundus was firmly fixed to the abdominal wall, but in which the cervix projected as far from the vulvar orifice as the completely inverted vaginal walls would permit.

1821 Spruce St.

A NEW OPERATION FOR LACERATION OR OVER-STRETCHING OF THE LEVATOR ANI MUSCLE.*

BY

JAMES N. WEST, M.D.,

(With three illustrations.)

If the many injuries to which the perineum and posterior vaginal wall are subject as a result of parturition, the most frequent in occurrence is a superficial laceration of the perineum in the median line not involving the levator and sphincter ani muscles.

* Read before the Woman's Hospital Society, February 24, 1905.

Two or three stitches properly placed at the time of the injury will result in complete restoration, and it is doubtful if this restoration is desirable, for, if it is made, the tear will occur again at the next labor. If not attended to at the time, the injury is of such a trivial nature that it would not require an operation unless one were being done for something else. The next most frequent lesion is the tear from one vaginal sulcus or the other, involving the anterior fibers of the levator ani (usually on the left), and extending down the center, tearing through the sphincter vaginæ and transversus perinei muscles down to the sphincter ani. With comparative frequency the laceration extends into both lateral sulci, meeting in the center and there extending to or through the

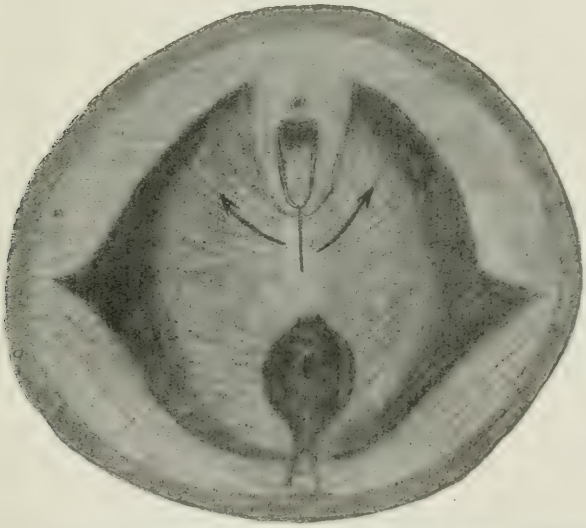


Fig. 1. Levator and sphincter ani muscles. Showing direction of retraction of muscle and fascia in laceration of anterior part of levator ani.

sphincter ani. These tears may be repaired in a way almost ideal by following the method of Emmet with modifications required by the conditions encountered.

Another injury occurs with comparative infrequency and it is to this lesion and its remedy that I would call your attention. As a rule when any considerable tear of the perineum and posterior wall occurs, the mucous membrane as well as the parts beneath is injured. The muscles and fascia retract toward their several points of origin and the mucous membrane falls and is drawn in upon the sulci formed by the retraction, covering over to a great

extent the lacerated ends. When such an injury is carefully studied after the parts have become healed over, the scar of the tear can be seen and the location of the deeper injury determined. Sometimes, however, the scar is only to be found superficially in the center, the levator ani being lacerated in the center but the mucous membrane having remained intact. The above condition is the one which has given me more trouble than any other. Several times after having repaired such an injury with apparent success, I have seen the patient six months or a year afterward

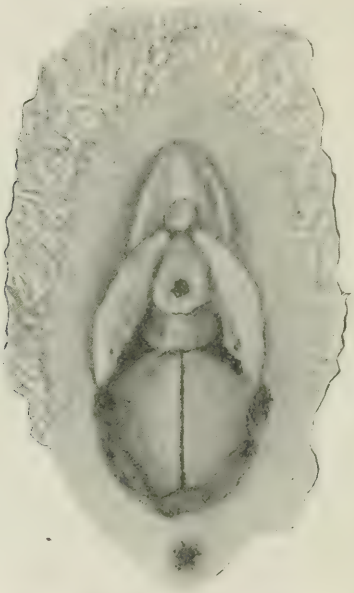


Fig. 2. Lacerated perineum and posterior vaginal wall with rectocele. Showing incision through the mucous membrane for the purpose of finding the levator ani muscle and fascia.

with practically the same rectocele which I had first observed. I have repeatedly seen the same result in cases operated upon by competent gynecologists. This led me to seek some more effective way of repairing the injury.

The operation which I present to you is of very limited application, as it is devised only to repair cases of laceration of the perineum where the tear is central through the levator ani and superficial muscles or where there has been a superficial tear with overstretching of the levator. The chief danger in it lies in

making an opening into the rectum which may result in a recto-vaginal fistula.

In studying the case before proceeding to operate, an exact idea may usually be obtained by passing the index finger of the left hand into the rectum and well out behind the side of the recto-vaginal septum to be examined. The index finger of the right hand passes into the vagina well out toward the same side and the two fingers are pressed together firmly and drawn together toward the center when the retracted muscle and fascia can be



Fig. 3. Excess of mucous membrane of posterior vaginal wall cut away. End of levator ani and fascia and denudation of perineum. Parts ready for suture.

felt to slip between them and thus be located. Then having located the situation of the muscle and fascia, a cut is made with straight scissors through the mucous membrane of the rectocele from the bottom of the tear up as high in the vagina as is desired to reach and bring together the levator. The mucous membrane is now carefully dissected off towards the sides of the vagina, most widely at its lowest part. This usually directly exposes the rectum, injury of which must be carefully avoided. The dissection is followed out toward the sides until a trace of fascia or muscle is encountered. This is followed up until the separated tissue

is found and isolated. The edges are then trimmed and brought together with No. 1 forty-day chromicized catgut interrupted sutures, the line of sutures being carried down to within three-quarters of an inch of the natural introitus vaginæ. The mucous membrane is then trimmed into proper shape to meet the usual superficial perineal denudation which is made, and is brought together from above downward by a row of interrupted ten-day chromicized catgut. The external sutures are of No. 28 silver wire and are inserted much in the way in which Dr. Emmet passes the outside sutures in his operation, the first or crown suture catching up the mucous membrane and fascia in the center and the others passing from without inward and upward like spokes of a wheel toward the hub.

The accompanying cuts will make the description of the operation plain.

I have performed the operation three times and in all have obtained a good result. One of the cases had been twice operated upon by others, and still presented a large rectocele. In the course of the operation I accidentally made an opening into the rectal mucous membrane as large as a silver half dollar, but repaired it at once with a fine catgut suture. The result was perfect.

This operation is quite limited in its application as the simpler lacerations may be satisfactorily repaired by the usual and simpler methods. It is presented to specialists for their use only, as I believe much more harm than good might result from it when done by those not well versed in plastic surgery.

71 West Forty-ninth Street, New York.

PAUL PORTAL, HIS LIFE AND TREATISE ON OBSTETRICS, WITH REFLECTIONS ON THE SCIENCE OF THE OBSTETRICAL ART IN FRANCE FROM THE RENAISSANCE TO THE 18TH CENTURY.

BY

CHARLES GREENE CUMSTON, M. D.,

Boston, Mass.

(*Continued from Page* 804 *of Vol. LI.*)

The precious teachings of Portal were not profitable to his contemporaries; Mauriceau had attracted the attention of every one, and while his treatise was published and republished, and

translated into English, German, Dutch, Italian and Latin; while Amand, Dionis and Lamotte were reprinted, and Viardel himself received the honors of a posthumous edition, Portal remained unnoticed and his merits unknown. Sweden and Holland alone honored him with a translation.

The reports of his cases will alone engage our attention. One which is particularly striking is that of a labor in which the woman's life was endangered on account of hemorrhage. There is another relative to forced dilation of the cervix in order to perform artificial labor, which saved the mother's life. In another is distinctly described the insertion of the placenta in the lower segment, and Portal textually says that it was its progressive detachment that brought about the hemorrhage. In this case he performed version and proceeded rapidly to the extraction of the child and placenta.

Delivery of a woman in danger of her life on account of loss of blood:

"On Wednesday, the 24th day of August, 1672, I was called to the Halles de la rue de la Cordonnerie to deliver the wife of one of my confrères, whom I found in danger of soon losing her life on account of the loss of blood, which was very considerable and had completely taken away her strength. MM. Kikebœuf, de Mersennes, Akakia and Buci, all four skillful and famous physicians of the city of Paris, had obliged her to receive all the sacraments; after which these gentlemen asked me to work and to endeavor to save the patient from the peril in which she was, having only my hand, after God, with which to save the life; and, to do this, I greased my fingers and my hand with oil, afterwards I carried my fingers up to the internal os of the womb, that I felt dilated in circumference and in length to the extent of 7 to 8 twelfths of an inch. I informed the gentlemen of this opening with my fingers. I introduced my fingers, the index, middle and ring fingers, and, separating them one after the other I dilated this ring, or internal orifice, by introducing these three fingers, one after the other; and, having somewhat dilated, I slipped in my thumb and little finger, thanks to the three others, and with these I formed a kind of uterine speculum by spreading them gently apart. I opened this ring in such a fashion that I had no difficulty in carrying my hand towards the fundus of the womb, where, in passing it up, I felt the placenta which surrounded the internal os, which was the cause of the loss of blood, because when the opening of the ring took place, the placenta, which was in direct

connection with this orifice, on account of a certain contiguity that it had with the womb at the point where it was adherent, this orifice becoming open it became divided, and, at the same time the vessels became divided, which caused the patient to lose blood in great amounts, and if not promptly aided she would die. I afterwards slid my fingers towards the internal and posterior part of the uterus, after having separated the placenta, to find the membranes which were full of their waters and also to give some light, by opening them with my fingers; and by making a rent in them the waters came away, although the orifices were occupied by my hand. This made it very easy to bring the feet of the child together. I seized them with my fingers and pulled more promptly than would have been possible without this dilatation. I baptized this foot conditionally, then I enveloped it in some linen and drew this foot and the leg until the buttock was outside. Then I observed the situation of the other thigh and the leg, which I recognized as folded on the belly, because if it had been bent posteriorly I should have been obliged to push back the buttocks in order to disengage the other leg and thigh, in which case it would have been ruptured; but feeling it in the situation that I have already described, I pulled boldly and without fear on the other leg and the remainder of the body as far as the shoulders, which I disengaged by placing my hand on the child's sternum and the right hand on the neck. By this means I extracted the child, which was very weak on account of the enormous loss of blood from the mother, and also because he had suffered greatly going through the cervix, which was not as greatly dilated as when things take place normally. As to the afterbirth, I had no difficulty in extracting it, because I had already separated it as soon as I had made the opening in the internal orifice of the womb. My confrère believed that his child was dead, and, having drawn it out, I begged the midwife to place it near the fire and the placenta, which still was joined to the umbilicus of the infant, in a receptacle full of wine which was on the fire. Pure wine was blown into its eyes, nose, ears and other parts of the face. We enveloped it in linen dipped in hot wine and we continually applied crushed onion at the mouth and nose and, from time to time, cloths dipped in hot wine on the scrotum, because it was a boy, and by these means we made him come to life as well as the mother."

In cases of serious hemorrhage, Portal was, unlike certain of his confrères, a determined interventionist as was Simpson

later on. The following is what he says concerning cases similar to that which we have quoted:

"If the loss of blood is so great that life is in danger, and if pregnancy is advanced and there is a tendency to the commencement of labor, which will be known by the signs already indicated, it is necessary to apply oneself to the labor, which is the only remedy to save the mother and child.

"The operation being judged necessary, he or she who is to do it should, in the first place, grease the hands with oil or fresh butter, afterwards slip the finger to the internal os of the womb."

"If this orifice is found soft and relaxed, one may work, but if it is otherwise, the operation must not be done, because, if this orifice is thick, one should be very careful to touch the womb until it becomes relaxed and softened, a condition which will be recognized by introducing one finger, and when this has accomplished something, a second, then a third, and by spreading the three apart one from the other, a kind of uterine speculum is formed. By this means, one will open little by little the orifice and slide carefully into the womb the entire hand; when this is being introduced, one will feel the membranes surrounding the child, which should then be ruptured with the ends of the fingers, this being done without difficulty."

Portal gives the history of the case of hydatidiform mole which terminated successfully, and he takes occasion to criticise Viardel's ideas.

"I would here warn my reader that, if I have discontinued to describe my observations from 1668 up to February, 1671, it was on account of a long disease which prevented me from attending to my ordinary exercises for a good lapse of time, as may be seen in the interval of this observation and of the preceding one.

"On Saturday, the 16th of February, 1671, I was called to see a baker's wife who had a great loss of blood; and, in order to recognize it, I introduced my fingers into the orifice of the womb, where I felt at the entrance a fleshy body of the size of a tennis ball of the largest size, which led me to believe that it was a mole. I employed the address that it pleased God to give me, to break it up into pieces with my fingers, which I withdrew out of the womb as fast as I separated them, as much as it was attached. As soon as I had thus separated this mass or fleshy body and drawn it out of the womb, the loss of blood ceased. This made me recall what I had read in a book by M. Viardel, who says that when one wishes to draw a child from the belly of its

mother, which presents by the head and cannot come out, it is necessary to pierce the head of the child with the extremity of the finger and then withdraw it.

"I then made the reflection that such a procedure should not be carried out, because it was necessary for me to make a great effort to open with the end of my fingers this mole, which is a body which is not as hard as a child's head, and consequently easier to open than the membranes of the scalp, and that thus, what he directed could not and should not be done in the manner which he describes."

Twin pregnancy was regarded as a serious case of dystocia by the majority of midwives and surgeons of the 17th Century. Mauriceau had spoken against this manner of regarding this condition, and Philippe Peu was particular to controvert it. He demonstrated in his treatise on obstetrics that many deliveries of a single fetus are far more serious than twin cases. Prejudice was strongly rooted in the minds of the profession at the time when Portal published his work, which, as is known, was before the appearance of Peu's treatise. Our author, although he recognized the fact that occasionally twins may be locked, nevertheless saw twin labors end in a happy way, as is shown by his relation of the following case:

"On Thursday, the 22d of October, 1665, I delivered two children from one woman living in the rue de la Corroyerie, and, although the preceding observation is quite similar to this one in many ways, it is, however, not so in all details.

"I found the abdomen of this patient of an extraordinary size, and this made me suppose that she was pregnant with two children. What confirmed me in my opinion was that the woman had passed much water and that the largest part had come away by a rupture of the membranes. Then I introduced my fingers into the orifices up to the fundus of the womb, where I felt the foot of one of the children and pulled upon it, and at the same time the body of this child followed. Having drawn it down, I applied two ligatures to the cord and cut it between them, as has already been said.

"The second child then presented with its membranes, which were bulging with the water which pushed them and which opened with considerable facility. This greatly aided me in recognizing the situation of this second child, which presented an arm that I pushed back, and, sliding my hand along the body of the child, I found the feet, which I pulled upon.

"The internal orifice contracted at the same time that the child and placenta were delivered. I found only one placenta. I observed nothing of any note other than a small line which was in the middle and which separated it. This made it appear that there were two, but it was so slight that it was with difficulty recognized.

"As soon as I had delivered the patient, the midwife gave her two spoonfuls of olive oil with sugar, which is the ordinary remedy among poor people. I asked the midwife why she gave her this potion, and she replied that it was to make her empty herself. This woman had no trouble during her entire postpartum."

The following case is in all probability one of eclampsia. The patient was seized with continuous convulsions, labor did not advance, medicines had no effect, and so it was decided to deliver the patient to see if the morbid phenomena would not cease. Here again Portal perfomed forced dilatation of the cervix. He found the cavity of the uterus extremely large on account of the amniotic fluid which had not escaped. In point of fact, it was a case of eclampsia occurring during gestation, and upon this occasion Portal makes a rather fantastic comparison between the waves of the ocean and labor. The extraction of the child was fairly easy in spite of the convulsions, and, in order to extract the head he resorted to the so-called maneuver of Mauriceau. Then he performed artificial extraction of the placenta, and the woman recovered after a long convalescence.

"On Friday, the 21st of August, 1671, I was called to deliver a woman at the end of the Notre-Dame bridge. I found M. Mathon, doctor of medicine of the Faculty and very expert in his profession, who begged me to examine the patient, who was in the midst of cruel convulsions.

"I introduced my finger into the orifices of the womb. I found the internal one enlarged to the size of a piece of 'quinze sols.' I made my report to him. We were in accord to bleed from the foot; this was done at once by M. Lombard, my confrère, very suitably, because the convulsions went away for an instant, and reason came back to her; but she soon afterwards was attacked by the same symptoms.

"During this time M. Moreau, of whom I have spoken before, arrived; a consultation was held and the enema composed of an emollient decoction in which half an ounce of benedittе, three ounces of mercurial honey and two ounces of oil of sweet almonds were dissolved, was ordered; and when this enema was rendered,

bleeding from the arm was to be resorted to and afterwards a cordial aposema was to be administered, composed of 10 ounces of thistle water, in which a dram of confection of hyacinth and two ounces of lemon syrup were to be mixed; that was to be given the patient in two doses.

"All these remedies, which were given from ten o'clock in the morning until about eight o'clock in the evening, had no effect, so that it was decided to deliver the patient and baptize the child.

"Then the danger was explained to the husband, but there was no other means of saving his wife than by delivering her. He replied to us that he begged us to do what was possible to save her, and this obliged me to reply that I would deliver her; but that if she should die, I begged him, and these gentlemen, to do me justice, and in no way blame me, because, under these circumstances he or she who operates, the woman then dying, is always the object of evil tongues to talk about. They all told me that this should in no way trouble me, and that this operation could only bring honor upon me and no blame whatsoever, because all these gentlemen judged the patient to be a dead woman and the operation necessary.

"It was remarked that the patient was without consciousness, as I have already pointed out. In order that the operation might be accomplished, I had her brought over to the edge of the bed, just as if it had been a dead body, having no other movement. Then, having greased my hands with butter, I slid my fingers along the cervix until the internal orifice was reached, which I found somewhat more dilated than it appeared to be in the morning when I examined her.

"Before this she had received the sacrament of the Extreme Unction.

"Afterwards, finding her in good condition, I slipped two of my fingers, one after the other, into this orifice, which I dilated by gently separating my fingers, spreading them apart from each other in order to make dilatation; and, afterwards, I pushed in a third one in order to have more force to better succeed in my enterprise. And this orifice dilating little by little, I introduced a fourth one, in order to make them all form a kind of speculum, preserving the nature of the parts by the gentleness which I employed. This aided me very much to insensibly slide my entire hand into the body of the womb, that I found very large on account of the distention of the membranes, the waters which

were still contained and the child which floated in the waters just as would a fish in a reservoir.

"All this obliged me to make a comparison with waves of the sea and the labor, because, when the ocean is in its calm, the waves coming upon the sands, they retire at the same time, leaving them almost dry; in the same way it happens that during the movement of the pains caused by the agitation of the heat which causes a swelling of these waters, which push against the membranes, which being pushed by the latter, cause the opening of the orifices and thus dispose matters for the exit of the child. Having examined all things well, I broke the membranes with my fingers and gave plenty of time for the waters to flow off; and, during their flowing off, I felt for the child's foot that I felt fall into my hand outside of the womb, and, looking for the other foot, I came upon the umbilicus. I seized this opportunity to observe the movements of the arteries and to recognize whether or not the child was alive; and, having remarked that it was living, I again took hold of the same foot that I had brought down to the orifice and drew it outside.

"After this, I took a piece of linen with which I enveloped this leg, and I pulled upon it with gentleness, but, sliding the hand up to the knee, I felt the middle part of the tibia of the other leg, which was crossed over the one that I was pulling upon, and drawing upon it, the other followed, after I had disengaged it. After having relaxed the first one, pushing it back a little in order to disengage the other leg, and having joined them together, I pulled them both to the orifice, because, if I had pulled upon the first with force, the one which was crossed would have broken. One should be careful about this, and act under such circumstances with judgment. While I worked, the physicians held the arms of the patient in order to judge of her strength, which was not very great.

Having pulled upon the feet of the child, I observed the rectitude of its body, and that the toes of its feet were turned towards the anus of the mother as far as was possible. It is true that occasionally one cannot accomplish this, and that this may proceed from two causes.

"The first, when the child is too strong one has difficulty to turn it.

"The second, when the womb contracts, a thing which happens quite frequently; in this case, it is impossible to place the child in the position that one desires.

"When I had drawn the child down to the cervix of the womb, the patient was taken with such a severe convulsion that it remained contracted for a quarter of an hour, which was the cause of the death of the child.

"The convulsion having ceased, I continued my operation and I drew the head with the greatest possible gentleness; and, in order to do this, I introduced my fingers in the child's mouth, and having hooked the lower jaw with my finger, I placed my other hand on its neck, having nothing to be careful about as far as it was concerned.

"I could not, however, extract it without using all my strength and all the dexterity of my fingers.

"It is, however, necessary to remark that in this kind of operations, it is not so needful to have strength as dexterity and prudence to practice it well, and to skillfully perform the operation. After I had extracted this child, I applied myself to delivering the mother of her placenta, which, in this kind of labor, after the extraction of the child, is nearly always easy to draw out of the womb. This does not take place ordinarily in all labors, as I have already said, and very often one is obliged to detach it because it is adherent, as happened in this case. This is why I slid my fingers along the cord to the womb, where I found the placenta which was extremely adherent, and I separated it from the declivous part which I felt at the opening of the internal orifice of the womb, towards its lower extremity on the right side; and, having detached it, I extracted it in an instant.

One will notice that during this time the woman was without consciousness and that she regained this more than twelve hours after having been delivered, without remembering having been delivered.

"The next day, in the morning, I asked her if she would not be delivered, and she replied yes, but as I told her that this had already occurred she made a reply that she had no remembrance of it, nor of the convulsive movements. After her labor, her belly conducted itself admirably well, without any considerable tension, although she had fever during twelve days, after which she became all right and has been well ever since.

"It was her first child and she had been subject to the major diseases very frequently, and besides her body was possessed of a bad condition."

"The following observation relates to one of those cases of dystocia which are so disagreeable for the physician and the

family, and which, at the same time, are so menacing to the health of the woman, the delivery of a putrified child. As is always the case, the child was so swollen that it could not pass through the pelvic outlet. The fetal parts which Portal came upon first remained in his hands, and it was necessary to remove the fetus piecemeal; interference became necessary, and the famous enema, so much employed at this time, naturally produced no improvement in the condition of the patient.

"On Saturday, the 5th day of September, 1671, I was called to see the wife of an officer of the King's household, who was believed to be pregnant.

"A midwife had insisted that, on the contrary, she was not.

"I called M. Touté, a very celebrated and skillful physician of the Faculty of the City of Paris, who did me the honor to ask my opinion, and if I believed that there was pregnancy. I replied to him that I believed it. He told me that he thought so also and that he was not of the opinion that the patient should be bled at the foot, although the midwife proposed it, telling us that there was no pregnancy.

"M. Touté, according to the lights that he possessed, only purged the patient with two drams of senna and one ounce of compound syrup of chicory, and the patient felt better.

"But one month after she was attacked by a great pain in the region of the kidneys and the abdomen. She sent in search of a midwife, who made a vaginal examination and said that she felt that the membranes of the waters presented at the external orifice, the size of one sou loaf of bread. The membranes ruptured and the waters flowed away. Then the midwife felt the internal orifice dilated to the size of a piece of thirty sols and one of the parts of the child which presented, which was the reason that I was called for.

"This young woman told me that she did not think she was pregnant, because she had had her sickness every month, and I well knew that another midwife had persuaded her that she was not.

"Nevertheless, after having slipped my index finger into the external orifice, I found that the internal one was flattened, which obliged me to push my finger toward the rectum, where I felt the foot of the child, which protruded as far as the knee.

"I seized it with my fingers, but this part became separated, although no violence was used, and it remained in my hand, which made me understand that the child was dead and putrified. This

leg was not larger than the thigh of a large frog which has been stripped. I begged M. Touté to come and see the patient again for the second time. He told me that, since the child was dead, remedies must be resorted to. We decided together upon an enema made with the root of a wild cucumber and a colocynth bulb that were boiled in an ordinary decoction which could be found in the house; and in a chopine of this decoction an ounce of diathenic should be dissolved.

"This enema had a marvelous effect in the pain that it caused the patient, which obliged her to bear down. In these efforts she expelled the rest of the child, which was entirely putrified, accompanied by an insupportable stink; if this little cadaver had not come out, we had decided to have the woman wear a pessary of cow's bone marrow.

"The child being expelled, another enema was administered to the mother without any effect.

"As this young woman had already lost blood in large quantities, she was extremely weak; this obliged me to insert my fingers into the internal orifice of the womb, which I found very hard and irritated. I exerted every effort, although with the greatest gentleness that was possible, to dilate this orifice. It was thickened to the extent of about three-twelfths of an inch. I pushed my fingers as far forward as I was able in order to withdraw the placenta, nevertheless holding my left hand over the region of the womb.

"This allowed me to draw out the afterbirth, all torn and piecemeal, with the exception of a small portion the size of a walnut, which, although adherent, was separated from the body of the womb.

"This necessitated keeping the patient perfectly quiet on account of the weakness from the loss of blood which she had undergone, which had persistently continued, and which would have caused death if I had not separated this portion of the placenta; but, this having been separated, the loss of blood stopped, and it came away only in small amounts.

"I laid aside all the bits of the placenta in order to make a demonstration the next day to M. Touté, who, having found the patient in rather good condition, left her the entire Saturday to rest.

"On Sunday, in the morning, she was given an enema composed of a common decoction and two ounces of common honey.

"About noon, a certain amount of stench came out, which caused

us to steam the parts and throw up an injection composed of a good handful of chervil. The night of Sunday to Monday went by quite quietly and without fever; she only felt a few pains in the region of the kidneys and abdomen, very mild.

"We judged that these were caused by wind. She asked to eat; we forbade it, but uselessly, because at about five o'clock in the evening she partook of some soup.

"On Tuesday, she was given an enema similar to the preceding one; the injection was changed and two pints of herb water was boiled containing the root of the wild cucumber and agrimony, and three ounces of common honey, and thus she was given these enemas.

"The Wednesday and Thursday we followed the same method, and our patient, still becoming better and better, left her bed a few days after."

The following cases are instances of difficult presentations, which will give an idea of the method followed by our author:

"On a Sunday, the twelfth day of the month of July, 1671, I was called to deliver a lady whom I found very weak and almost without any pains that might aid her in the exit of her child.

"I slid my fingers into the cervix of the uterus, and carrying them as far as the internal orifice, I felt that the child presented by the mouth.

"I withdrew my fingers immediately, because in these encounters one may easily injure the child's eyes and render him blind.

"I resolved to have patience and wait for the pains; but two hours having gone by without any coming on, and the strength of the patient diminishing, made me resolve to deliver her. She begged me from one minute to another to give her relief, or to open the abdomen, on account of the great weight that she said she felt in the womb and in the surrounding parts and in the bladder.

"I had her relatives come together and presented to them the condition in which I saw this poor sick woman and the peril in which she was. They begged me to try to give her relief and to do what I could.

"She was very young, and this extreme youth increased the difficulties, the more so for the reason that the parts are very narrow with the first child, as I have said at the commencement of this book.

"I advised her to receive the sacraments before undertaking

anything for her delivery. Having said that she desired it, and this having been done, I prepared myself to do the operation.

"I introduced my fingers, after having greased them, into the parts of the woman; with them I pushed back the child as gently as it was possible for me to do, because, if the slightest violence is done to the womb one may tear it near the internal orifice, as I have seen happen."

The next case is a face presentation:

"On a Saturday, the second day of May, 1691, I was called to see the wife of a shoemaker who lived in the rue Brisemiche.

"I found her in bed. I examined her and felt that the child presented by the face and that it was extremely wedged in and pressed down. I carried up some butter that I had hardened in cold water, because it was too soft. And, in order to facilitate the exit of the child, I advised the woman to brace up and push when the pain came on and not otherwise, because the efforts that she might make at other times would be rather bad than salutary, and that it was necessary to allow the face to come down, although this would render the labor more difficult and longer, and that no violent measures should be taken but Nature be allowed to act; that if one examined her often the child's face might be injured or some of his parts, and especially the eyes; being certain that nearly all the children that come this way have deformed faces and are covered with injuries, but all this is righted quite easily by the use of wine and oils, of which I have spoken in Chapter III. Judging, consequently, that nothing should be precipitate, I remained there, doing hardly anything other than to insert butter into the orifices of the womb, so that our patient was victorious and the labor very fortunate for the child."

The following is a breech presentation:

"On a Sunday, the 21st day of the month of March, 1666, I delivered a woman living in the rue Saint-Bon, examination of whom allowed me to feel a child, which presented by the right buttock, which obliged me, the waters having been discharged by opening the membranes, to softly push back the child with my fingers, introduced by slipping them along the thigh and the leg so as to find the foot, and, having felt it, I drew it out of the orifice. Then I took some water and christened; after this I took a cloth and drew it out, both the body and the shoulders, but I had considerably difficulty in disengaging the head. It was necessary for me to introduce two fingers of my right hand into the

mouth of this child, all the time holding him with the left hand applied on his chest, which was a very great help to me, because I extracted him in a moment and, at the same instant, the woman was relieved and, treated afterwards like by other patients, got well without any accidents."

The following is a delivery of an enormous child, who presented by the side of the neck, shoulder and clavicle:

"The 16th day of April, 1667, I was called to deliver a lady, living in the rue des Juifs of a child of prodigious size, which presented by the lateral portion of the neck, the shoulder and the clavicle, which occupied the entire internal orifice of the womb. Having greased my hand, I introduced my fingers into the external and internal orifices, and pushed back as best I could these parts into the body of the womb. After this I introduced my hand into the interior of the uterus along the thighs and legs of the child, up to the feet, which I brought together. Having brought them into contact, I drew them out of the external orifice, and when they were out I baptized the child conditionally, and afterwards enveloped the legs with a piece of cloth and drew them out, and the thighs followed, likewise the buttocks, which I found so large and so full of flesh and fat that I had a great deal of difficulty to disengage them and draw the child out as far as the shoulders; then I introduced my fingers over the shoulder in order to get rid of this part. I placed my left hand on the chest of the child and my right on the vertebræ of its neck, but this head was so large that no matter what I did, by introducing my fingers into the mouth and ears of the child, employing all my strength, it was impossible for me to draw it out of the womb, the head became separated and, in spite of what precaution I could take, the head remained in the womb.

"I made every effort to extract this head with my fingers, and I admit that I was never placed under such great difficulties, having no proper instruments for this operation, without which a surgeon should never go to abnormal labors. And, finding myself thus caught, I begged the husband of the patient to go to my house, porche Saint-Mederic, to ask for my instruments. While he went, I encouraged this woman, and I assured her that all would go well."

"It will be noted that after the separation of the head from the body, I kept my hand in the neck of the womb in order to keep the internal orifice dilated, because, if it closed down, it would have been impossible to extract this head, as happened once to a

surgeon in the same street, whose wife died from not having paid attention to this precaution, and this accident which was not unknown to my patient caused her a great deal of apprehension, as well as others present.

"The husband of the patient having returned and brought my instruments, I took with my right hand that which was necessary to perform this operation, and having conducted it to the point of the annular ligament of my left hand, I introduced it as far as the end of the middle finger, which I kept bent in such a way that the point of the crotchet could not injure the patient. I then punctured the head of the child in the sagittal suture, this head being quite as large as that of a man, and after having thoroughly punctured it I pulled on the crochet with the right hand and, aiding it with the left, I withdrew the membranes of the neck of the child, which were separated from the body, and with the right hand I drew the head straight down, so fortunately that ten days after this woman came to me to thank me, no unfortunate accident having arisen, and I reproached her for having taken such little care of herself, as she told me that she felt perfectly well."

871 Beacon Street.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

Niagara Falls, May 25, 26 and 27, 1905.

The President, Emelius C. Dudley, M.D., *in the Chair.*

ADDRESS OF WELCOME.

Dr. Carl G. Leo-Wolf, of Niagara Falls, made the address of welcome in which he aptly compared the flow and course of the Niagara, its rapids and rocks, etc., with the evolution of the American Gynecological Society from its beginning to this, its thirtieth annual meeting.

Dr. Ely Van de Warker, of Syracuse, responded in behalf of the president.

ACCIDENTAL RUPTURE OF THE NON-PARTURIENT UTERUS WITH REPORT OF A CASE.

Dr. George W. Jarman, of New York, said that although the subject had been pretty fully treated, he believed it was of sufficient importance to warrant recording some cases seen by him. If rupture occurred in the hands of the trained gynecologist, how much more likely was it to happen in the hands of those who were not trained. He used the term "rupture" instead of "per-

foration" because the rent was made by a dilator rather than by the sound or curette. Many of these cases were not published, oftentimes they were not discovered. Uterine tissue that was undergoing degenerative changes from any cause was easily ruptured.

Case I.—In 1891 he was hastily summoned to see a patient and found a woman, 34 years old, with an incomplete abortion at the third month, which had happened two weeks previously. Curettment was decided upon. The condition was not at all septic. Dilatation was accomplished with the Wylie's dilator, the forceps were introduced, and to his amazement intestines were pulled down into the vagina. The cavity was cleaned and the débris washed out through the cervix, gauze drainage was introduced, and a good recovery followed.

Case II.—In 1894 he was called to see a case of retention of a four-months old dead fetus. There was a brownish discharge, with a sensation of weight complained of in the abdomen. A laceration had occurred which extended through the posterior uterine wall, as well as through the lower one-third of the uterine wall, and through the peritoneum. A dead fetus was removed. Gauze drainage was introduced.

Case III.—In 1898 he was called to see a patient upon whom a physician had operated for chronic endometritis. The curette had passed into or through the uterus. Examination by sound showed a perforation. It was decided to open the abdomen. Blood was found in the pelvic cavity and coming from a fair-sized artery, which was secured. After cleansing the parts peritoneal drainage was used.

Case IV.—In 1900, while operating for a double pyosalpingitis he dilated the cervix and proceeded to curette. A few seconds after he felt the curette pass into the peritoneal cavity. The abdomen was opened and a small perforation was found in the posterior aspect of the uterus. The abdomen was closed and no drainage was deemed necessary. Prompt recovery followed.

Case V.—In 1901 he was called to see a patient whom he had confined three times. She thought she was pregnant and had consulted a phyiscian, who used electricity, passing a rod into the uterus. A second attempt was made and, as a result, pain ensued. together with some flow. The day following there was chill and fever. Phenacetine was given and apparently with a reduction of the temperature. Nine days had elapsed since this chill. When Dr. Jarman saw her she was thoroughly septic, and she was sent to the hospital for operation. The abdominal cavity was opened and was found to be full of foul-smelling pus; fully one-half a pint of foul pus was evacuated. The cavity was cleansed and through-and-through drainage was established, leaving the lower end of the wound open. Nine days after a fatal termination occurred.

Case VI.—In 1900 he was hastily called by a physician to see a patient who had had her vagina perforated by a nurse who was giving a douche of carbolic acid solution. She was in apparent

collapse. The nozzle was of hard rubber and about five inches in length. After giving the douche there was no return flow. The missing portion of this douche was found to be in the rectum and pressure upon this part caused the expulsion of the solution. The patient made an uneventful recovery from this seriocomic accident.

The following deductions seemed warrantable: (1) The operation of invading the cavity of the uterus should not be regarded lightly, and the details of asepsis should be carefully carried out. (2) Great care should be exercised in the introduction of the steel dilator. (3) As one's experience increases the use of the uterine sound decreases and the fingers are more often found preferable to the curette in removing secundines. (4) Sterilized water is the best fluid for irrigating the uterus. (5) If perforation of the uterine wall occurred it was better to perform laparotomy and assure oneself of the safety of the patient than to hope that no untoward results would ensue. (6) If one can not be certain of asepsis it is better to use a small drain through the vagina and a slightly elevated posture after the operation. (7) In properly conducted cases there should be no mortality if seen soon after the accident.

Dr. A. Palmer Dudley, of New York, said it had been his misfortune to enter the peritoneal cavity through the uterus four times. His first experience was with Dr. Hanks. He had been called upon to curette a uterus, and when he introduced the forceps to draw away what he supposed to be secundines, he was surprised to draw out intestines. The intestine was gotten back through the opening in the uterus, and they both decided that the best form of treatment was to send the woman to bed and keep her quiet. She has since given birth to two children.

Dr. Hermann J. Boldt, of New York, said that perforating the uterus did not always cause serious trouble, and that a great deal of discrimination should be used in deciding upon action. In cases where criminal abortion was attempted and where there was any suspicion that infection had taken place, operation should invariably be performed. He had perforated the uterus a number of times and had seen it done by others. One of his assistants had perforated the uterus and it was thought necessary to open the abdomen; he found the opening had closed. He had in mind another instance which he had published abroad. This woman believed herself to be pregnant, and had been curetted by a physician to produce abortion; the doctor told him that he withdrew coils of intestines through the cervix. Forty-eight hours after this Dr. Boldt saw the patient, but it was not until the third day that any severe symptoms of peritonitis developed. The abdomen was opened and was found to be filled with blood and feces, the bowels having been torn. In another case a woman had been curetted in a physician's office to produce abortion. Dr. Boldt saw her forty-eight hours after, when she had developed a septic peritonitis. The abdomen was opened and efforts made to save

her, but she died. Whenever there were evidences of sepsis or where there was any reason to suspect this condition the abdomen should invariably be opened and the rent closed. In most instances, however, when curetting and perforation of the uterine wall occurred, under aseptic conditions, he believed one should stop at once and leave the patient alone, and that the majority would recover. Do not make any attempts at douching; let them alone.

Dr. Eugene Boise, of Grand Rapids, reported a case in which he, when interne at Charity Hospital, made such a perforation of the uterine wall before the days of asepsis. With the patient on the table he was able to pass the sound up to the handle. Dr. Isaac Taylor was present and said that the patient should be taken to bed and given morphine. Dr. Taylor tried to pass the sound, but it only was introduced three inches. Dr. Boise then again passed it to the handle. This accident had occurred when curettment was attempted on a subinvoluted uterus after abortion. He agreed with the suggestion made by Dr. Boldt that, when perforation had occurred under aseptic conditions, recovery would follow in the majority of instances by placing the patient in bed and leaving her alone.

Dr. Fernand Henrotin, of Chicago, said this accident had happened to him four times. In one instance a douche nozzle was found in the abdomen. The rules he had made for himself were as follows: If an accidental rupture of the uterus had occurred, caused by a small curette without any apparent damage and in a non-septic case, he did nothing. If, however, the patient was at all septic, if the uterus was anteverted and the perforation occurred in the posterior wall, he did a vaginal section and introduced a drain. If the uterus, on the other hand, was retroverted and the perforation was in the anterior wall he did an immediate laparotomy.

Dr. Andrew F. Currier, of New York, did not believe there were any persons present who had not seen cases of perforation. In many of these cases no damage would result if intestines had not been withdrawn and the patient was not in a septic condition; in such cases it was safe to leave these patients alone and not interfere. If the injury, however, to the uterus had been a severe one there was an additional condition which presented itself which had not as yet been touched upon. If the uterus was in fairly good condition then it would be sufficient in most cases to cleanse the parts and close the rent, but supposing the uterus was soft and friable, as was the case with many of the patients reported at this meeting, then one had the alternative of closing the wound or removing the uterus. In many instances the removal of the uterus was perferable, resulting in greater benefit to the patient than would result from closing the wound. The key to success in most cases was proper and adequate drainage. If there was a condition of sepsis, simply closing the wound would not do, because we were by no means sure that the condition of sepsis would

not continue. He, therefore, believed it preferable to remove the uterus in such cases.

Dr. A. Lapthorne Smith, of Montreal, had perforated the uterine wall seven or eight times. In two cases he opened the abdomen and found that the accident had occurred from the use of the dilator and not from the curette. If the muscle was in a state of fatty degeneration it was very soft and friable and the muscular fibers could be easily separated. One should never use force in curetting the uterine cavity through danger of perforating the wall. He referred to one case in which, after a miscarriage, about ten yards of gauze were introduced; much alarm was expressed at this apparent capacity of the uterus, but it was found that the gauze had passed into the abdominal cavity through a rent in the uterine wall. Peritonitis developed and he opened the abdomen and found a great deal of blood and a large rent in the uterus where the packing had passed through. That case demonstrated to him how very soft such uteri were, and he found great difficulty in closing up the little rent because the stitches would not always hold.

Dr. Clement Cleveland, of New York, supposed that all the gentleman who had thus far spoken on the subject had reference to the sharp curette. One should draw a distinction between the two kinds of curettes, the blunt and the sharp. Sims invented the sharp curette and Thomas the blunt one, and Thomas had very positive views regarding the use of the sharp curette and rarely used it. Sims was equally as positive regarding the utility of his instrument.

The general practitioner to-day considered himself a gynecologist, and in every obstretrical bag one would find the bivalve speculum, placental forceps, a sharp curette, etc. One rarely would find a dull curette in these obstetrical bags. Nearly all present, he said, had no doubt had women come to them with uterine trouble and make the statement that their physician had suggested that curettment be done, or else that it had been done. He wished to draw attention to the injury done by such a curette in the hands of the general practitioner. The dull curette would do harm, but the sharp curette did a great deal of injury. The dull curette would readily remove diseased epithelium, while the sharp curette would remove a great deal of the mucosa as well. Many of these patients come to the gynecologist and complain of pain, scanty menstruation, etc., and you will find the mucous membrane partially or wholly destroyed. The sharp curette had its use, but only in the hands of a skilled man. The American Gynecological Society should use its influence to eliminate the sharp curette from the bag of the general practitioner; it was fraught with the greatest harm to women.

Dr. Mosely, of Baltimore, spoke regarding the dangers of dilatation, and said there was one form of laceration, or rupture of the uterus, that had not been spoken about, the portion lying below the internal os, and lacerations occurred here more often than was

recognized. If the internal os was soft it could be readily dilated with the point of the dilator, and there was a minimum of danger in perforating the fundus. He had had several cases under observation of laceration or rupture that had occurred between the folds of the broad ligament. Such called for little attention, and the injury took care of itself if the patient was kept quiet. This form of rupture he did not believe was recognized as often as it occurred. The dangers of perforation of the uterus by dilators would be reduced to a minimum if the dilators used had parallel blades. Another source of danger was in the use of the screw.

The use of the dull or sharp curette depends entirely upon the character of the condition encountered and upon what it is to be done for. There was much danger of perforation with the dull curette, even more than from the use of the sharp curette. Where there was a large amount of tissue to be removed with the dull curette it required a great amount of force, and this made its use under certain conditions a factor of danger.

Dr. William H. Wathen, of Louisville, did not think that the dull curette had any place in surgery, and had no place anywhere, unless it was to aid in the withdrawal of decidual remains lying comparatively loose in the uterus. Any man who could not use the sharp curette without great danger of perforating the uterus had better refer the case to one who could. Nearly all the perforations that had been reported to-day had been done by ignorant men, or in the hands of the gynecologist in his early experience, when he did not know so well how to use it. Curettage should be done by the sharp curette and the removal of decidual remains by the finger; in nearly every instance this can be done; in immediate abortions dilate and remove the contents of the uterus, and all could be done with the fingers only. In his early experience he said that he dilated a great deal, but now he did not do so once in fifty times when curetting the uterus. He said he found no necessity for doing so. He could enter the uterus with his two sized curettes and complete the curettage without any previous dilatation. He was also able to introduce the average sized irrigator for washing out the uterus. Therefore, the danger from dilatation of the uterus should be avoided by avoiding the use of the instrument for dilating the uterus. The dilatation necessitated by the presence of secundines should invariably be done by the finger.

Dr. Ely Van de Warker, of Syracuse, felt very strongly on this subject, and believed that the teaching in the modern text-books was wrong. He had occasion to look through some twenty text-books, and 75 per cent. of them advised the use of the sharp curette, and also stated that if one was to get ideal results the endometrium must be scraped and cleaned; that that was the ideal thing to be aimed at. Such teachings were absurd and dangerous. Instruments were dangerous *per se* whether dilators, curettes, dull or sharp. The greatest danger accrued from the use of the dilator. After the removal of the débris attending a normal

pregnancy, or labor, or early abotion, the involution process was going on for months; during that time the uterus was friable and its muscular walls easily ruptured, and here the dilator came in and did its greatest harm. The element of danger in the use of these instruments cannot be removed, and the best men would at times perforate the uterus. But it should be remembered that the best men knew just what to do when such an accident occurred, while the other men did not. The operation of curettage was one of the greatest danger, and should be done only by the skilled gynecologist.

Dr. Seth C. Gordon, of Portland, Me., wished to ask Dr. Jarman a question in regard to the fourth case he reported, where he removed pus tubes and closed the opening. Did he consider this to be good surgery? If he was going to remove both pus tubes, would he not better remove the uterus as well and make a clean sweep of it?

Dr. Philander A. Harris, of Paterson, referred to two cases of perforation of the uterus, one with a sound, the other with forceps. The cases that required curettage were those in which pregnancy had lately existed, or, possibly, because of the presence of a small tumor, and such uteri were easily dilated. A point that he wished to emphasize was that dilatation was a misnomer. It was not dilatation, but divulsion.

Dr. T. A. Reamy, of Cincinnati, said that years ago the uterine sound was used more for diagnostic purposes than to-day, and on several occasions he had perforated the uterus. The organic changes occurring in the uterine wall made this accident more frequent than was suspected. This accident might happen even in the hands of the most expert operator if such organic changes had occurred. If perforation occurred with the sound he ordinarily let the patient alone.

Dr. Emelius C. Dudley, of Chicago, personally preferred the sharp curette. In dilatation he never thought that the dilator was the thing that perforated the uterus. Within five weeks he had had an unfortunate experience, and the only one where the perforation was caused by the curette itself. The uterus was an exceedingly thin one. The abdomen was opened and a considerable amount of bloody fluid found; the abdomen was flushed with saline solution and the wound in the uterus was closed, the wound in the abdomen was closed and the patient made a good recovery. He was led to do a laparotomy because of the foul discharge from the uterus. The fluid from the abdominal cavity did not show the presence of bacteria.

Dr. Jarman closed the discussion. He could not think of a case where the uterus had been torn or perforated where he would not open the cul-de-sac, drain and elevate the head of the patient. Elevating the patient's head sixteen or eighteen inches had been worth more to him than anything else. Drainage should be through the cul-de-sac.

It was not the curetting that caused any perforation of the

uterus, but the introduction of the curette; whether a dull or sharp curette he imagined the same amount of force exerted would cause the perforation, because on neither was there any cutting edge.

He did not think that Dr. Wathen meant to say he did not use the dilator at all. In all lacerated cervices, held intact by old cicatrices, a curette could not be introduced if larger than a sound, and such cervices must be dilated with a Peasley's dilator.

RETROVERSIO UTERI—A NEW OPERATION FOR RADICAL CURE.*

Dr. Arthur W. Johnstone of Cincinnati read this paper.

A NEW PLAN OF PROCEDURE IN RETROUTERINE DISPLACEMENTS.

Dr. E. E. Montgomery of Philadelphia read this paper. He said that retrodisplacements of the uterus more frequently demanded restoration to normal position than any other form of displacement. Nature's forces should be imitated as far as possible in relieving malpositions. The Alexander operation, and its modifications, were in this line of procedure. Its usefulness was limited to the uncomplicated and mobile uteri in which operative interference was least demanded. The majority of the intra-abdominal operations upon the round ligament employed the best part of the ligament in their manipulation and left unaffected its weakest portion. The various operations of ventrofixation and ventrosuspension were departures from the normal and placed the uterus in abnormal relations, and rendered painful and difficult the performance of its normal functions. The vaginal procedures required considerable dissection, were ineffective in restoring normal relations, and were to that degree to be condemned. The operative procedure he suggested was a combination of operative procedures employed by Gillian, Ferguson, and Simpson. It permitted of treatment of diseased ovaries and tubes, left the uterus a freely movable organ, supported it by normal elastic and muscular structure capable of undergoing evolution and involution, and, finally, afforded no opportunity for the formation of unfortunate adhesions.

The operation consisted of the following steps:

1. Through an abdominal incision a temporary ligature was passed beneath each round ligament about 1½ inches from the uterine cornua and secured by a hemostat.

2. The two ends of one of these ligatures were threaded into the eye of a pedicle needle, the round ligament was seized with pressure forceps just external to the ligature and drawn into the median line to render the external portion of the ligament tense. The peritoneum of the anterior portion of the broad ligament was picked up and snipped with scissors, etc. The ligature was thus carried between the layers of the broad ligament until the abdominal wall was reached, when it was thrust through the muscular

* See original article, page 93.

structure and was withdrawn from the needle external to the aponeurosis. The same course as followed with the second ligature.

3. Having drawn the superficial fascia away from the opening in the aponeurosis, the ligature was rendered tense while pointed scissors were introduced, closed, on the other side of the ligature and their blades slightly separated as withdrawn. Their withdrawal was generally followed by a loop of the round ligament which was drawn up by the temporary ligature. The loop of the ligature was readily passed through, could be teased there by pushing back the tissues with the point of the scissors, while traction was made by the ligature. The loops of both round ligaments having thus been brought out upon the aponeurosis they were

4. Secured by catgut sutures to the aponeurosis layer. Careful examination was previously made to ensure the proper position of the uterus.

5. The wound was closed. The crescentic shaped incision through the fascia and aponeurosis above the pubis and the vertical incision of the peritoneum was such as Stimson suggested and afforded increased facility in reaching the ligaments and treating diseased conditions within the pelvis, but was prone to the formation of hematoma between the layers which might become infected and mar satisfactory results.

The advantages which might be claimed for this operation, he said, were (1) it closely imitated the normal condition and employed the natural ligaments for its support, and these were able to undergo evolution and involution during gestation and the puerperium. (2) It employed the strongest part of the round ligament and left no lesions within the abdomen to form unfortunate adhesions. (3) It permitted a careful exploration of the contents of the pelvis and afforded an opportunity for the proper treatment of diseased conditions of the uterine appendages and vermiform appendix.

Dr. J. Wesley Bovée of Washington, D. C., said there were several points to be taken into consideration in order to properly treat retrodisplacements of the uterus. First, were the ligamentations of the uterus, *i. e.,* its mechanical support. The causes of retrodisplacements were various and the treatment should be adapted to each. In a virgin with congenital retrodisplacement the trouble lay in faulty ligamentation, the vaginal roof not being penetrated at its proper place; it was too far forward, as was brought out in 1882, when the rule was laid down that if the cervix perforated the vagina two and a half inches from the pubis it was abnormally forward. In these cases it was found that the leverage was wrong because the vaginal wall was attached too low. Again these cases may be attached too high posteriorly with the formation of a deep posterior cul-de-sac and with practically no anterior fornix. Here the leverage would be strongly toward pulling the cervix forward. If the cervix approached the pubis it would subject the uterus to intraabdominal pressure from the top

or on the fundus, and this tended to force it downward. Therefore, the proper thing to do in such instances was to change the leverage and support the anterior vaginal wall from the cervix and to re-attach it at a high point. If the posterior vaginal wall was attached too high up, detach it and bring it down nearer the tip of the cervix. Again he said that in many of these cases, especially where there had been posterior occipital presentations, the facia, as well as the uterosacral ligaments, had been ruptured during parturition and the posterior fornix was absent and the posterior vaginal wall flopped down. In such cases one must secure the fascia as well as repair the ligaments. The line of procedure, he said, should be as Dr. Johnstone had suggested, *i. e.*, treat each case along Nature's lines, repair the supports, and do not try to introduce additional ones. In a large number of these cases he believed the trouble lay in a weakening or an improper attachment of the uterosacral ligaments, and also there might be a slow grade of infection which aided in the production of this mal attachment and even might lead on to rupture. In many cases one would find the injury was not low down but in the uterosacral ligaments high up. Therefore, he would state that the proper operation, if performed on any ligaments, was upon the uterosacral ligaments particularly, as well as upon the round ligaments. Where the injury was situated high he did not believe the work could be done through the vagina and one must work through the abdominal incision. He had followed the plan of shortening these ligaments through the vagina or abdomen, and in most cases he shortened the round ligaments as well. To shorten the uterosacral ligaments by the vaginal route did not necessarily mean that one should go through the peritoneum.

He believed the longitudinal incision was preferable to the transverse because it avoided certain injuries and also brought the fascia together in such a way that when operation was finished there was a transverse line instead of a longitudinal one. Often the uterosacral ligaments could be shortened according to the method of Wylie and Dudley, and the round ligaments could be shortened through an abdominal incision. Shortening the round ligaments did tend to hold the uterus forward. A very important point he found in these cases was to place the patients in bed in such a position that less strain was upon the ligaments, that was, Sim's position. If the patient was allowed to lie on the back the uterus would flop backward.

In two cases he had found the round ligaments not attached in its normal position, i. e., it was attached to the anterior superior spine of the ilium instead of the spine of the pubis. In such cases, of course, shortening of the round ligaments would be of no avail unless the surgeon attacked this attachment.

Dr. J. Riddle Goffe of New York said that Dr. Johnstone's paper was along the lines that he had been working on for some years and he had endeavored to support the uterus by working upon the uterosacral ligaments. It was believed that every or-

gan in the body was suspended by ligaments except the uterus; the lungs, heart, liver, spleen and intestines, all were maintained in place by ligaments, but it had been believed for a long time that the uterus was not held in place by ligaments. Yet it was a well-known fact that if the perineum was torn through the uterus and rectum would still remain in position, and, therefore, they must be held in position by ligaments. After a study of about ten years, he believed the uterosacral ligaments were most important in retaining the uterus in its proper position, and be believed that if the action of any ligament should be more carefully studied it was this ligament. This ligament had been attached through the vagina as well as by the abdominal route, but he believed this should be supplemented by shortening the round ligaments through an anterior vaginal incision. If the uterosacral ligaments were difficult to reach one should be content in shortening the round ligaments through the anterior vaginal incision. In 1896 at the Denver meeting, he stated that the only purpose subserved by shortening these ligaments was to take the strain off the uterosacral ligaments and allow them to recover their tone. The practicability of this operation he said he had demonstrated to his own satisfaction. Anyone who studied it well would find t not only a feasible operation but a practicable and satisfactory one. He did not believe the purpose of the round ligament was to hold the uterus in position but to limit the excursions of the fundus when the bladder was filled and to restore it to its normal position when the bladder was emptied. During gestation this kept the fundus well to the front and prevented the intestines from getting between it and the abdominal wall. As gestation advanced the uterus was held against the abdominal wall, and so the intestines were prevented from getting in front of the uterus.

Dr. George Gellhorn of St. Louis believed that the uterosacral ligaments were much too small and too thin to be able to hold a large uterus in position. These ligaments were but peritoneal folds and with but a small amount of muscular fibers and connective tissue. Only when in an inflammatory condition were these ligaments large enough to become palpable.

Dr. T. A. Reamy of Cincinnati did not believe that the members of the society should be so positive and extravagant in their statemens regarding the uterosacral ligaments and the function they bore in supporting the uterus and retaining it in position.

He said the clinical experience of each man on this question must count. He believed that a pessary would supplement the action of the uterosacral ligaments partly by its mechanical action and partly by its pressure exerted below. His personal clinical experience was this: In many instances of retroverted uteri, where the uterosacral ligaments were not performing their function, the shortening of the round ligaments and placing the patient in bed and using a pessary, these patients got well. If such clinical testimony was worth anything, he believed it should have its place and should be carefully considered.

Dr. George W. Jarman of New York said that in 1895 he read a paper on retrocession of the uterus and his treatment for these cases was to get the uterosacral ligaments through the culde-sac, drawing them down tense and cutting them, carrying back the fascia towards the sacrum. He had been able to follow seven cases, and in not one had the uterus become retroverted or retroflexed.

Dr. Seth C. Gordon of Portland, Maine, endorsed the operation as described by Dr. Montgomery. The Gillian operation had appealed to him as being the best to correct retroversions. He believed the round ligaments were important elements in supporting the uterus. When there were pathological changes, which resulted in carrying the uterus back, undoubtedly the round ligaments had become weakened and allowed the uterus to sag with consequent retroversion. He had done the Gillian operation, grasping the ligaments about two inches from the uterus and making that the crest of a fold, bringing it up through the abdominal incision, stretching both legs of that fold, placing in sutures at the top. It was practically the principle of an Alexander operation. He had used it with success in cases of procidentia occurring in old women.

Dr. Clement Cleveland of New York said that the uterus was supported by both the round and broad ligaments, but in order to say what he wished to, he would refer to another operation, one that was not his own. This operation he had been doing for years was devised by Dr. Bissell, of New York, and it had given him entire satisfaction. It tended to shorten the round ligament and also the anterior layer of the broad ligament. Dr. Cleveland here gave a black board demonstration of Dr. Bissell's operation. He had had several cases of labor following this operation, and a most careful examination disclosed the uterus to have remained in perfect position.

Dr. Hermann J. Boldt of New York said that many operations had been devised, and each man spoke in favor of a particular operation. He believed that one should base his remarks on his own practical and personal experience. Dr. Boldt said he had performed a large number of Alexander operations in those cases in which he believed them to be indicated, those cases in which the body of the uterus could not be held anteposed by pessaries. In many instances the patients had gone through two or three pregnancies and the uterus was still in good position. Shortening the round ligaments, when properly performed, would enable women to go through pregnancy without any redisplacements. He referred to a woman he saw a few days ago who had gone through three confinements and the uterus was still in good position and the woman was perfectly well. He said we might devise as many operations as we wished, but the one that withstood clinical observation was the one that should be advocated.

Dr. Arthur W. Johnstone closed his part of the discussion and emphasized some of the points made by the last speaker. In

those cases where there was a simple anteversion without prolapse the round ligament acted like a guy-rope. In some cases he had seen the uterosacral ligaments as large as a large key, even larger than the round ligaments. Few men realized the value of these ligaments until they studied them carefully. He referred to the fashionable girl of a few years ago who assumed the forward position, leaning forward as she walked; in such cases he said the uterosacral ligaments pulled in a vertical direction. The origin of these ligaments was from the transverse processes of the second and the third sacral vertebræ. To claim they were the only ones to support the uterus was entirely wrong. The keystone of an arch merely locked that arch. The action of the uterosacral ligaments was like the block-and-tackle that elevated a yard on a ship. Dr. Johnstone pleaded for a more careful study of the physiology and mechanics of this subject. He believed that the Alexander operation would be used for many years to come.

Dr. E. E. Montgomery closed the discussion. He said that no one operation was applicable to all forms of displacement. Shortening the round ligaments when there was considerable prolapse was like handling the uterus with gables and probably would exaggerate the patient's discomfort. The advantages of shortening the round ligaments was simply that they might be used as guy-ropes and result in the intraabdominal pressure being exerted on the posterior and not on the anterior uterine wall. If the uterosacral ligaments were in normal position and retroversion occurred, shortening the round ligament only served to withdraw any strain that might be on these ligaments. The operation of introducing the ligament through the broad ligament and out through the abdominal wall might follow the course of the round ligament, causing it to emerge from the internal opening at a place where the round ligament did. It served the same object that was attained by the Bissell operation in holding the uterus forward.

ARTERIOSCLEROSIS OF THE UTERUS AS A FACTOR IN UTERINE HEMORRHAGE.

Dr. Palmer Findley of Chicago read this paper.*

TRANSACTIONS OF THE CINCINNATI OBSTETRICAL SOCIETY.

Meeting of March 9, 1905.

Dr. George E. Malsbary Read a Paper on Tuberculosis and Pregnancy.*

Dr. William Gillespie.—There are a few points brought out in the paper of Dr. Malsbary which I think we ought not to allow to pass without some discussion. Anything like a general dis-

* See original article page 71.
† See original article page 28.

cussion of the paper would be impossible, for the reason that it covers so much ground.

Considerable emphasis was placed upon the advice given the patient in regard to sexual intercourse. My experience has been that whether tuberculous patients marry or not they very seldom ask whether they may have sexual intercourse. In cases where I have been impelled to advise for the benefit of the woman that pregnancy be avoided, they have invariably not regarded abstinence from sexual intercourse as the proper means to prevent conception, and have asked me concerning some measure to prevent a pregnancy.

There is one point which I would like to have Dr. Malsbary explain in his closing discussion, and that is on what basis he asserts that creosote may induce abortion. There are many drugs in the pharmacopeia, quinine being prominent among the group, that are said to be influential in inducing abortion. I think the drugs which induce abortion are exceedingly rare. When in country practice I have seen a number of women go out in the yard and get tansy, make tea of it, and take it in such quantities that they would have convulsions, and yet they would go on uninterrupted to full term. When practicing in a malarious district I have given quinine to women who were pregnant, and they went on to the full term of their pregnancy. I have never seen a case of pregnancy in which quinine was given to the patient where she seemed to be affected adversely by this drug. It is easy, however, to see how abortion might be induced from toxemia in a case of malaria or from the congestion of internal organs associated with chill. In malaria, where quinine is given a pregnant woman, if abortion follows a chill, it is attributed to quinine. I would like to know if there have been any experiments with creosote which would show that this drug has any such tendency. Personally, I give creosote for digestive disturbances, for gas in the stomach and intestines, using the carbonate of creosote, and have given it in a large per cent. of pregnant women coming under my care, and have seen no bad results from its use. I usually give five drops after eating. The question of the influence of pregnancy on tuberculosis and of tuberculosis on pregnancy is an exceedingly important one. I have known of a number of girls who were apparently in danger of pulmonary tuberculosis who immediately fattened up, and became stout, after marriage. I have also known a number of women who had apparently no tendency to lung trouble who immediately went down, and died of pulmonary tuberculosis after marriage and a pregnancy had occurred. It would seem to me if the general nutrition of the patient was impaired, and she was nervous and irritable as the result of sexual hunger, there would be no objection to her marrying. I have known patients, however, in which the tubercular process was well enough advanced to produce temperature for a number of weeks, and even with some consolidation of the apices of the lungs, to

recover, and afterwards they married. All of them were advised not to become pregnant for two or three years.

What to use as a preventative of pregnancy is a matter of considerable importance. There are some who think that we have not the moral right to give such advice to patients, but personally I would not hesitate to recommend the best methods I knew for the prevention of conception in a case where I thought it would be dangerous for the woman to become pregnant.

Dr. J. H. Landis.—I would like to ask the essayist in reference to the use of tuberculin in these cases.

Dr. C. D. Palmer.—Reference has been made to the decision of a certain judge, in the matter of a suit of breach of promise, by a young lady against a gentleman for not marrying her because of tubercular trouble in herself. The judge did recognize the fact that she had no cause for suit under the circumstances. Such a suit as that is not justifiable, and the verdict of the judge is certainly correct in the light of our present day knowledge on the subject of tuberculosis. Such a suit, however, would have succeeded twenty-five years ago, proving that we now know much more about this disease. We have pretty well established the fact that consumption is a contagious disease; that a husband may take it from his wife, and a wife from her husband, and also that children born of tuberculous parents are exceedingly liable to an inherited tendency in that direction. I think it is correct to say that pregnancy delays the progress of tubercular disease when it exists in a woman; in other words, I think that in a woman who is pregnant the tubercular process is more slow than if she were not pregnant. I think this is owing to the general conditions which go along with pregnancy; increase of body weight, increased blood supply, increase of the red blood corpuscles, the enlarged condition of the several viscera of the body, particularly of the heart; and also because of a certain degree of physical resistance to disease and injury which pregnancy insures. This apparently is one of the wise provisions of nature. When, however, parturition takes place, with its loss of blood, its confinement, and the diminished quantity of food, then the tubercular process goes on with increased rapidity. So what is gained during the pregnancy is quickly lost after, and the life of the woman is practically not lengthened at all. There is one thing which came to my mind when the gentleman was reading his paper, a case which was brought to my observation when I was an attending obstetric physician to the Cincinnati Hospital, now more than twenty years ago. The case was that of a pregnant woman, who was delivered in the natural way, none of the soft tissues being damaged. After parturition she commenced to have fever, and I was at first in an unsettled state of mind as to whether she had puerperal sepsis, typhoid fever, or miliary tuberculosis. I soon ruled out the idea that she had any puerperal septicemia, and then the idea of typhoid fever. Of course, at that time we did not have the means of accuracy in making a diagnosis in typhoid fever that we have at

the present time. I suspected that she had miliary tuberculosis. She had some cough, but no distinctive signs of any structural trouble in the chest, some slight râles, being present, that was all. She died in about two weeks. I requested, after her death, that a post-mortem examination be made, and I witnessed it. This revealed a miliary tuberculosis of the lungs, miliary tubercles in the brain, and also in other organs of the body. It was a case of acute miliary tuberculosis in a puerperal woman.

Dr. W. D. Porter.—I would like to add a word or two in the form of an inquiry as to the use of tuberculin in pregnant women. Under the heading of treatment, I understood the essayist to say that pregnant women bear tuberculin well. I am aware that tuberculin is used for the purpose of diagnosis, but did not know that it is still used for treatment. I have seen the statement made somewhere recently that the advocates of this method of diagnosis admit that once in a great many cases the disease seems to be rapidly disseminated by the use of tuberculin. I know the essayist is qualified to speak on this point, and I would like to have him enlighten us.

Dr. Arthur W. Johnstone.—This paper deals with a subject which is so important that I feel that we ought not to allow it to pass without discussion. I wish to compliment the author on the thorough manner in which he has gone over the subject. There are some points which have not been noticed which I think would be germane to the subject.

1. Thirty years before Koch was heard of, or we knew that there was such a thing as the tubercle bacillus, Heitzman discovered that there was a difference in the white blood cell of persons suffering with tuberculosis and that of perfectly strong persons. This difference was so marked that when I was a student he advocated that persons ought not to be allowed to marry until their blood was examined. The difference is this: In the perfectly healthy and strong individual, scattered throughout the protoplasm of the white blood cell, there are anywhere from ten to twenty granules, with more or less of thickened substance, which takes the stain, whereas in the tubercular subject these granules drop in number to four or five, and show nothing like as much living matter as there should be; and on that point alone he based his diagnosis. He said way back in the 70's that you could tell the tubercular people by their phagocytes. Later developments have shown us that many a latent tuberculosis lies hidden away in some lymph gland concealed by fibrinous matter of one kind and another, remaining there awaiting some stimulation to elaborate it and distribute it over the body. The history of such cases as have been outlined here to-night I can only confirm. I have seen case after case of young women with a tubercular history, looking tuberculous, and with a slight cough, who would get married and then they would commence to bloom out like a rose. They would become pregnant, go through this period beautifully, and within two or three months after lactation un-

doubted symptoms of tuberculosis would develop, and they would die in a few months. What does this mean? It means that this increase of bodily nutrition, which has been provided to supply the fetus, does increase the growth and strength of the various maternal tissues. When a woman becomes pregnant all the digestive apparatus is stimulated and pushed to the limit, and this is the ammunition with which to fight tuberculosis. During the nine months of gestation there are very few, or practically no symptoms of tuberculosis; it is more or less passive, but after lactation is established then it commences to show itself. What does this mean? It means that after delivery, when the whole economy, which has been so recently stimulated to its full extent, settles down for a long struggle to supply fetal food throughout the period of lactation we do not have the stimulus that we had when the uterus was pregnant, and the nutrition which was stored up in the body to carry the mother through this period begins to give way, even in a healthy woman, and by the time a woman has nursed a baby for from six to eight months she has become much depleted physically. It is during this trying nursing time that the disease lights up in all its intensity, when the economy is having all it can do to supply food for the infant.

I am sorry that the doctor did not go into other forms of tuberculosis than that of the lungs. We as gynecologists see a great deal more of tuberculosis of the peritoneum than of the lungs. It is true we find all kinds of mischief done by the tubercle bacillus, but the cases which come most frequently to us are some form of tuberculosis of the genital organs. My experience has been exactly the opposite to that detailed in the author's paper, *i. e.* that tuberculosis does not travel from the tubes upwards. I had a striking case some years ago (and these tubercular processes are always secondary to a primary focus) in which the woman seemed to have as much tuberculosis upon her diaphragm as she had in any other part of her body. I opened her abdomen and got out three or four gallons of fluid. I then sewed her up, did not remove her appendages because the disease in them did not amount to anything in comparison with the tubercular disease in the rest of the body. To my great surprise this woman recovered and went home well. She appeared at my hosiptal later on suffering with a case of appendicitis, but of her other trouble she had remained perfectly well. I opened her abdomen again, and there I found the appendicitis; but both her tubes, which I had examined carefully, having them both in my hands six years previous, and were found to be in a normal state, with here and there a miliary tubercle, were stuffed full of tubercular matter, about as full as they could be. I took out both sets of appendages and the woman made rather a tedious recovery, but she is now again home and well. Just before this woman came to me another woman called upon me to see about making some repairs to her genitalia; she had some external tears of the perineum and she also had a badly lacerated cervix. She was in a bad condition physically, and I

told her that this was no time to perform any operation upon her, that we would wait until we could get her built up physically. Within a week after this she was brought to me suffering with a great deal of pain in her abdomen, and after making an examination I thought I could feel an enlarged tube. Her history pointed to tuberculosis. I said that she had little time to wait, that she must enter the hospital immediately. In eight weeks from that time I operated upon her and found an encysted dropsy with general tuberculosis all through the abdomen. I removed the tubes in this case. I did not want to take any chances on secondary infection. That point was brought out very clearly by Mayo. He gave a long table of cases illustrating this very point, which only goes to show that the vast majority of cases of tuberculous peritonitis are secondary; that there is a primary focus somewhere. Ten per cent. of all of our cases are tubercular. The point now to be considered in connection with the paper is that just such conditions as the foregoing follow pregnancy. I have seen at least a half dozen cases in which a violent acute peritonitis came on within two months after labor. All of them ran a typical tubercular course. The routes of infection through the peritoneum, in fact, the general routes of infection, are numerous. I remember a case distinctly where a man had a low grade of tubercular peritonitis which passed through the diaphragm and set up a low grade of pleurisy. If you will go back to the book of Kline on the central lymphatics of the diaphragm, you will understand how these things occur. There are roundabout bypaths for the lymphatics. We must not overlook a tubercular focus which may be in Scarpa's triangle. The most common thing in my early practice was tuberculosis of the mesenteric glands, which very frequently was the cause of miliary tuberculosis. So cases of tubercular peritonitis are secondary and not primary.

Dr. Rufus B. Hall.—In reference to peritoneal tuberculosis, as seen by the gynecologist and abdominal surgeon, I agree with the last speaker concerning the mode of infection in peritoneal tuberculosis, especially in women. The essayist will probably remember that I presented a paper to the American Society of Obstetricians and Gynecologists in which I emphasized that point. This paper was read at Washington, and we had a lively discussion. I reported one hundred and ten cases of tubercular peritonitis, which I had tabulated and recorded carefully, and showed in the large majority of cases (perhaps in 90 per cent.) in women it could safely be said that you could intelligently trace the infection through the vagina, through the uterus to the tubes, and therefore the nidus of infection of the peritoneum in women is usually the Fallopian tube, and if you hope to remove the nidus of infection, the tube should always be removed. Sometimes after opening the abdomen of the patient the surgeon finds a desperate condition present, and his courage fails him, so that he will not complete the operation.

In the list above referred to I reported a number of cases with

the mode of infection. For instance, one case occurred in a prominent lady physician where the nidus of infection was the appendix. She was supposed to have appendicitis, with no involvement of the tubes. When she came to the operation it was found that the whole peritoneum was covered with little tubercles. She afterwards married, and up to this time has not borne children. She has remained symptomatically well since I saw her, now some six or eight years.

Also in that list I mentioned one or two cases, men, upon whom I operated for recurrent appendicitis, which was supposed to be tubercular and tubercular only. Hence, I agree with the last speaker that in tuberculosis of the peritoneum there is a tubercular nidus from which this trouble springs, and in women we usually look for it in the tubes. To illustrate what the tubes do in this connection: The case reported by the last speaker calls to mind a case which was operated upon by a prominent surgeon of this city. She had an encysted peritoneal dropsy, with a large quantity of fluid. He drained the abdomen, and the patient fainted on the table, and he thought she would die, so he could not go ahead and finish the operation. After this she never regained her health, and a couple of years later she came to me with two lumps, one on either side of her abdomen, which were connected with sinuses which discharged an ounce or two of pus every day. With her consent I operated upon her. I found that these sinuses ran down to the fimbriated ends of the tubes, into which I could put my thumb, the openings being so large. The tubes were as large as a banana and three or four inches long. I removed both tubes and the sinuses healed up—and she has since remained well, gaining thirty or forty pounds in weight. Such cases only emphasize the importance of removing the tubes if you expect your patient to get well.

Dr. George E. Malsbary.—First, I wish to thank you for the discussion, which has been most entertaining and instructive. The freedom of discussion of medical subjects is a pretty good index as to the vitality of a medical society.

The first speaker referred to sexual intercourse after marriage. From a medical standpoint, marriage means pregnancy; a physician's consent to marriage is equivalent to a declaration that pregnancy will not be deleterious in a given case. When it comes to the matter of sexual intercourse in tuberculosis, we must be especially careful when we are called upon to give advice, for not only is pregnancy often dangerous in such cases, but excessive sexual indulgence may also prove harmful.

As to creosote sometimes producing abortion. I have seen abortion follow the therapeutic use of large doses of creoste, such as are necessary in advanced cases of tuberculosis. When creosote is given for gastric catarrh, as in the case mentioned by the doctor, small doses are used, which are not likely to cause abortion. How large doses of creosote would you give in tuberculosis? It is a good general rule to keep within the tolerance of the individual.

I have frequently given 120 drops of the carbonate of creosote every four hours. It is best to begin with a small dose, say 10 or 20 drops, and gradually increase the dosage; but creosote must be given in large doses, in order to accomplish good by its use in advanced tuberculosis. These patients, too, take it remarkably well; they apparently tolerate the drug better than do non-tuberculous individuals.

In reference to patients fattening after marriage, as mentioned by one of the gentlemen. The paper was on tuberculosis and pregnancy, and did not attempt to discuss the broad general subject of marriage in individuals threatened with tuberculosis. We are all in a sense threatened with tuberculosis, inasmuch as we are all more or less exposed to infection. The case reported by the doctor was apparently an instance of sexual starvation, and it seems that all we can do is to congratulate the young lady upon having married. It is fortunate that a false diagnosis of tuberculosis was not made in her case, which might have resulted in advice against marriage.

As to the moral right of the physician to prevent conception in tuberculosis. It would take too much time to enter into a full discussion of this subject. The man who would advise artificial means of preventing conception in tuberculosis, may take comfort in the German saying that everybody has a little tuberculosis. If we feel that the patient's life depends upon the prevention of pregnancy, we ought to advocate such means of prevention as are of positive value, and the one which is the most absolutely trustworthy is total abstinence from sexual intercourse. If circumstances should obtain where such a course would be impossible, we ought to advise a dissolution of the union, just as we would advocate the permission of a man or woman to break a promise to form such a union on similar grounds.

One of the members asks if I would advocate permitting a man with a large family to have a divorce because his wife became tuberculous. That is entering into the medico-legal aspect of the subject, with which I do not feel competent to deal. My own opinion is that a man who would apply for divorce upon such a plea ought to be castrated; but that would probably be neither ethical medicine nor good law. Possibly it would be well in such cases to grant what was formerly known as a divorce from bed and board, which does not relieve the man from the financial responsibility of the care of the family.

Tuberculin has been referred to, and the essayist has been asked if he still uses it and to what extent it is used. Of course I still use it, just as I would continue using any rational remedy that I found to be of value. Indeed, I would use it simply for empyrical reasons if for no other. How much is it used? All the men who have reported their results in large numbers of cases treated with tuberculin have reported good results, and advocate the use of the remedy. You will find that the men who decry the use of tuberculin are those who have used the remedy in only a few cases, or

not at all. The opposition to tuberculin has never been so great as was the opposition to the introduction of the diphtheria antitoxin. I have been asked if you can compare tuberculin and diphtheria antitoxin. Yes, you can, in a way. That is to say, the use of tuberculin in the treatment of tuberculosis in the human being is pretty much the same as the production of active immunity against diphtheria in the horse for the purpose of securing a serum containing the diphtheria antitoxin. The tuberculin stimulates the formation of protective substances, so that the body furnishes its own antitoxin against tuberculosis. There has been a marked change in regard to the dosage of tuberculin. Formerly we tried to secure a certain degree of reaction, as indicated by fever, but now we try to avoid a reaction. It reminds one of the early use of calomel, when the physician tried to induce a reaction, indicated by salivation, whereas now we try to avoid salivation, and thus are able to use calomel with safety. When tuberculin is used for diagnostic purposes, we produce a reaction. But I have never observed any bad effects from tuberculin. As suggested by one of the members, the claim was at one time made that tuberculin may disseminate tuberculosis. However, observation along this line disclosed the fact that disseminated tuberculosis does not occur so frequently in patients treated with tuberculin as it does in tuberculous patients who do not receive that treatment. The use of tuberculin makes the disease less likely to be disseminated.

One speaker has referred to tuberculosis developing a long time after labor. It would seem difficult to ascribe to pregnancy cases of tuberculosis occurring after the puerperium and after the mother had ceased nursing. Tuberculosis, of course, may occur at any time.

Reference has been made to the seeming improvement observed in tuberculous women during pregnancy. It is true that they usually show improvement during gestation, but this is more than counterbalanced by the retrogression during the puerperium. Tuberculosis usually progresses more rapidly after labor.

Certain experiments bearing upon peritoneal tuberculosis were referred to in the paper, because they are so strikingly at variance with the reported observation of many of the gynecologists. My own observation has been that peritoneal tuberculosis occurs only in individuals that have tuberculosis of the lungs. I have never examined a case of peritoneal tuberculosis without finding pulmonary tuberculosis. That may be because I am an internist, and you, as gynecologists, may have a different experience.

Finally, we ought to be optimistic concerning tuberculosis, for many of these cases recover absolutely.

REVIEWS.

THE ANATOMY OF THE HUMAN PERITONEUM AND ABDOMINAL CAVITY. Considered from the Standpoint of Development and Comparative Anatomy. By GEORGE S. HUNTINGTON, M.A., M.D., Professor of Anatomy, College of Physicians and Surgeons, Columbia University, New York City. pp. 292. Illustrated with 300 Full-page Plates, containing 582 Figures, many in Colors. Lea Brothers & Co., Philadelphia and New York.

IN this magnificent work the value of embryology and comparative anatomy is emphasized in elucidating some of the difficult and complicated problems encountered in the study of human anatomy. Its author hopes that the broader interpretation of structure and function obtained by ontogenetic and phylogenetic comparison will impart an interest to the study of human morphology such as the subject considered solely in the narrow field of its own limitations could never arouse. The book represents part of the course in visceral anatomy as developed at Columbia University. The sections dealing with the morphology of the vertebrate ileocolic junction and with the structural details of the

MALFORMATIONS OF THE GENITAL ORGANS OF WOMEN. By CH. DEBIERRE, Professor of Anatomy in the Medical Faculty at Lille. pp. 182, with 85 illustrations. Translated from the French by Henry C. Simes, M.D., Emeritus Professor of Genito-urinary Diseases in the Philadelphia Polyclinic. Philadelphia: P. Blakiston's Son & Co., 1905.

This work contains three chapters, one on the anatomy of the genital organs, one on their development, and one on their malformations. It contains nothing new either in text or illustrations, and is marred by a number of inaccuracies.

THE AMERICAN YEAR BOOK OF MEDICINE AND SURGERY. A Yearly Digest of Scientific Progress and Authoritative Opinion in All Branches of Medicine and Surgery. Collected and Arranged, with Critical Editorial Comments, by J. M. Baldy, M.D., Samuel Horton Brown, M.D., J. Chalmers Da Costa, M.D., J. Leslie Davis, M.D., W. A. Newman Dorland, M.D., John H. Gibbon, M.D., Virgil P. Gibney, M.D., C. A. Hamann, M.D., Barton Cooke Hirst, M.D., D. Braden Kyle, M.D., Walter L. Pyle, M.D., J. Hilton Waterman, M.D. Under the General Editorial Charge of GEORGE M. GOULD, M.D. *Surgery*, pp. 694. Illustrated. Philadelphia and London: W. B. Saunders & Co., 1905.

This handsome volume contains a review, a good, thorough, practical review, of the work done in general surgery, obstetrics, gynecology, ophthalmology, diseases of the nose, throat and ear, orthopedic surgery, and anatomy. In general excellence it fully maintains the high standard of the previous volumes.

human cecum and appendix are considered more fully. The illustrations are nearly all from preparations in the museum of the university, and wherever practicable the direct photographic reproduction of the preparation is given. In other instances careful drawings are presented. The text is divided into an introduction and four parts. The introduction gives a sketch of the development of the vertebrate ovum, and especially of the celom, alimentary canal, cloaca, and divisions of the peritoneum. Part I discusses the anatomy of the peritoneum and abdominal cavity, with the comparative anatomy of the foregut and stomach. Part II takes up the comparative anatomy of the peritoneum in the supracolic compartment of the abdomen. Part III gives a general review of the morphology and physiology of the vertebrate intestinal, a serial review of the ileocolic junction and connected structures in vertebrates, the phylogeny of the types of ileocolic junction and cecum in the vertebrate series, and the structure of the cecal apparatus and specialized morphological characters of colon in rodents and ungulates. Part IV gives the morphology of the human cecum and vermiform appendix.

The work embodies an enormous amount of original research, and is of great value to those interested in the teaching of anatomy or in the study of certain of its more abstruse problems.

The book itself is beautifully bound, the plates are clear and well executed, the type work excellent, the paper good, with wide margin and uncut edges.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Metabolism During Pregnancy, Labor and the Puerperium.—J. Morris Slemons (*Johns Hopk. Hosp. Rep.*, Vol. XII) finds that during the last days of pregnancy the voidings of urine represent a smaller percentage of the fluid intake than in the non-pregnant state. Marked diuresis precedes and follows delivery, but a relative suppression of renal activity exists while labor is in progress. The puerperium presents a higher urine output than exists in pregnancy, but is below normal if the mother suckles the child. The total nitrogen elimination of the urine is below normal during the last days of pregnancy, with a further decrease during labor—a marked rise occurs usually about the second day after labor and there is a tendency to attain the normal level in about two weeks. There is a change during pregnancy in the relation existing between the compounds of nitrogen. This may be appreciated by studying the ammonia eliminated. The percentage of the total nitrogen thus excreted is increased in pregnancy, reaches its greatest height at time of labor and then gradually decreases. The presence of twins accentuates the points which characterize the single pregnancy, storing more water and nitrogen and eliminating more nitrogen as ammonia, while the puer-

perium presents no essential difference in metabolism. When the fetus dies in utero there is a return to the non-pregnant type.

Existence of a Nervous Reticulum in the Villi of the Placenta.—Giuseppe Fossati (*Annali di Ostet. e Gin.*, April) has, by the method of Golgi, demonstrated in the placental villi, what appears to be a fine nervous reticulum, rich in branches, which occupies the central and peripheral portions of the villi, excluding only the superficial portion. It is formed of filaments of various diameter, with well defined margins, and having at certain portions swellings from which begin secondary fibers. The larger filaments are at the periphery of the villus, between the epithelial zone and the central part of the villus. The method of arrangement and of ramification of the fibers along the vessels, the terminations, similar to those in other organs, the swellings, and the penetration of the epithelial layer by some of the fibers, show that this is a true nervous reticulum. The importance of this knowledge with regard to the origin of the epithelial layer, as well as in itself, is very great. The origin of this reticulum is not as yet demonstrated.

Lutein-cell Changes in Atresic Follicles During Pregnancy.—Ludwig Seitz (*Zent. für Gyn.* May 13) says that lutein-cell changes are a normal phenomenon of pregnancy, and not a casual factor in the formation of the vesicular mole. He found in the yellow bodies and in the degenerated follicles two distinct zones: an inner representing mucous membrane, and another representing connective tissue, which he calls reticular tissue, containing lutein cells. The hypertrophy of the follicular wall resembles the changes in the unimpregnated state. The author has examined the ovaries in 36 cases, 19 of which were removed at operations during pregnancy, and 17 of which died by accidents of pregnancy and labor, followed by immediate autopsies. These cases must be considered normal and typical. In pregnancy there is a marked stimulation of the lutein-cell changes in the atresic follicles; fat and lutein accumulate in them. At the end of pregnancy this process reaches its highest degree, and after labor a retrograde change immediately takes place. All the follicles undergo the same changes during pregnancy; lutein cells increase until there is no longer a follicular lumen, and the follicles resemble little corpora albicantia. Sometimes this lutein-cell change seems to reach the theca externa. This is a specific change of pregnancy. It may be compared to the decidual changes. The lutein changes in cases of vesicular mole are pathological, as in chorio-epithelioma; yet all are influenced by the presence of the elements of the fetus. There is a hyperemia of all the pelvic organs, and this is the cause of the increase in lutein-cell changes. In chorio-epithelioma hemorrhage lessens development, and retrograde changes take place which differ materially from the lutein-cell changes of normal pregnancy.

Examination of an Early Stage of Vesicular Mole.—A. Stoffel (*Monat. für Geb. und Gyn.*, May) details the microscopic examination of the material removed in a case of vesicular mole, which was formed after an abortion at six weeks. The abortion was

incomplete, only pain and bleeding taking place, and no ovum being passed. Slight bleeding continued for six weeks longer, when dilatation was done and uterus was emptied. The mass was situated in the right horn and on the posterior wall of the fundus. It was covered with protuberances, some of which contained fluid and some were truly cystic. There was no trace of the fetus, but there were masses of degenerated decidua and chorion. The chorion was covered with small prominences and cysts. The material contained in them gave the reaction for mucin. The author believes that there are mucin forming elements in the uterine mucous membrane, and that this mucous substance found in the chorion was the result of the liberation of this substance by degeneration. There were many masses of round cells, without any true stroma, simply consisting of undeveloped hydropic cells. Some of the cells had a true epithelial structure. The exochorion included cubical cells, Langerhans' cells, and a great increase of the elements of the syncytium. There were many cells containing vacuoles, a sign of the hydropic tendency of the degeneration. There were also large coagulated masses, a product of fibroid degeneration, and there was muciparous degeneration of the cells of Langerhans. The increase of epithelial elements seemed to have eroded the stroma, as occurs in true epithelioma. The protuberances of the exochorion seemed to be due to increase of the elements of the connective tissue. Since mucin is not found in the normal ovum, the author believes that this should be considered the most important characteristic of the vesicular mole. The decidua varied much in thickness. In parts it was very thick, and covered with reddish-gray prominences, the size of a linseed. There was a compact and a spongy layer, no muscular and no elastic fibers. The spongy tissue was filled with glands, and in the stroma was extravasation of free blood cells. The glands in the spongy layer were degenerated and dilated, and the lumena were filled with degenerated epithelial cells, and extravasated blood. There were many leucocytes, mostly mononuclear and a few polynuclear. There had been an inflammatory process of the decidua, in part acute, in part chronic, as was shown by the infiltration of the normal decidual substance, and the secondary metamorphosis of the tissue. The author believes that this inflammation of the decidua is an etiological factor in the production of the vesicular mole.

Prophylaxis of Hereditary Syphilis.—A. Pinard (*Ann. de Gyn. et d'Obst.*, April) calls attention to the fact that a husband may procreate several healthy children, after having had syphilis, and later may have children affected by congenital syphilis. Every syphilitic who wishes to produce healthy children should undergo prophylactic treatment before cohabitation with his wife, and should repeat this treatment before each attempt to produce a child, and the wife should have anti-syphilitic treatment during her pregnancy. This is necessary, even when the patient has previously submitted to the usual course of anti-syphilitic treatment considered as rendering his disease non-contagious. This prophylactic

course consists of iodide of potash and biniodide of mercury, and should be carried out for six months before attempting to procreate. Pinard has never seen a failure to obtain healthy offspring after such a course, while he has many times observed failure when prophylactic treatment was not undertaken.

Puerperal Sepsis.—At the onset of this trouble, Alfred L. Galabin (*Pract.*, March) examines carefully the genital canal, noting any lacerations or abrasions. If these appear inflamed, sloughy or unhealthy, they should be mopped with a strong antiseptic, such as a solution of mercuric iodide in alcohol 1 in 250, or with pure carbolic. If pseudo membranes are present, a more caustic solution must be used, sufficient to cause a slough. The next step should be to obtain a specimen from the interior of the uterus. If saprophytic microbes only are found the case is probably one of sapremia and the prognosis is favorable. In cases of only moderate pyrexia where there is no reason to suspect any adhesions or partial retention of the placenta or membranes, it may be sufficient to wash out the uterus. Vaginal douches should be given with continued regularity, especially if any lacerations are present. The bowels must be kept open. If these measures do not give relief in twelve hours or so, explore the uterine cavity. This should be done at once if the fever is high, if there has been an adherent placenta, or if a portion of the membranes have been left behind. The finger is the safest and most efficient instrument to explore the uterine cavity and remove any foreign matter present. If a curette is used the best form is a large, blunt flushing curette. If there is much bleeding, pack the cavity with 10 per cent. iodoform gauze. Repeated irrigation of the uteras is inadvisable in the absence of an offensive discharge, the case being one of streptococci infection and the injection having already spread. The diet should be liquid and abundant. A fair amount of brandy or champagne should be taken. In some severe cases advantage has been derived from intercellular injections of a pint or more of a normal salt solution. High temperatures are best controlled by direct application of cold. Antistreptococcic serum is a remedy of value. It may be used at the onset and continued or not, according to the results of the bacteriological investigation. We have an absolute indication for operation in the formation of localized abscesses which should be opened and drained as soon as discovered. The mortality of hysterectomy for this condition is very high.

A. Kuyvett Gordon (*Pract.*, March) divides these cases roughly into three types. One variety is a condition of acute septic intoxication due to retention, and subsequent decomposition of placental tissue, membranes and clots. The onset is usually within three days. This form occurs in about 10 per cent. of the cases and all recover. Another class is a more purely septicemic type, where nothing is found within the uterus which at first will account for the symptoms. The endometrium, however, is teeming with streptococci. The discharge is usually non-offensive. The onset

is usually about the fourth or fifth day; clinically, their condition is of the typhoid type. About 20 per cent. have recovered.

The third type of cases includes those also of a septicemic type, but due to the bacillus coli communis. There is an absence of retained decidua, the onset is late, about the eighth to the twelfth day. Clinically the condition is one of extreme gravity, and prostration is profound; there is occasionally a peculiar yellowish earthy tinge to the skin; the uterine discharge is often fetid. The prognosis of these cases is almost hopeless.

In the treatment of the more severe cases of puerperal septic disease Gordon has found in almost every case that curettage was necessary. For this he uses a sharp curette, as he considers it safer and more reliable. The endometrium should be removed down to the muscle, then the interior of the uterus should be flushed with sterile water or a weak antiseptic solution at a temperature of 120° F. until all hemorrhage has ceased. The surface is then dried as far as possible and mopped with pure iodine. Then, before the patient recovers from the anesthetic an injection of antistreptococcic serum should be given without waiting for the results of the bacteriological examination of the specimen removed from the interior of the uterus before operation. A polyvalent serum should be employed. The two most common complications have been pelvic suppuration and septic thrombosis.

Puerperal Tetanus.—John F. Roderer (*Amer. Med.*, March 4) reports a case of puerperal tetanus with recovery. The symptoms appeared ten days after delivery. Eighteen days later she had entirely recovered. From the tenth to the fourteenth day she had only tonic spasms; clonic spasms then commenced, and lasted until the twenty-seventh, during which time she had at least 1,500 convulsions. During the first five days all spasms were very severe and painful. Tetanus antitoxin was administered on 32 occasions. In all 660 cc., or 132,000 immunizing units, were given. The injections were given under the skin of the abdomen and thorax. Pain in the joints, eruption and high temperature commenced on the twenty-eighth day and lasted for three weeks. These were undoubtedly due to the antitoxin. After each injection of antitoxin a change in the character and number of spasms could be noted.

The Use of Plates of Agar-Blood-Serum in Obstetrics.—Fabre and Amsted (*Bull. de la Soc. d' Obst. de Paris*, March 16) state that the practitioner may gain valuable information as to the diagnosis and treatment of puerperal infections from the examination of the blood and lochia of every puerperal woman, and this may be of the greatest value in deciding whether such cases in a maternity institution should be isolated. This examination is made by the use of plates made of agar mixed with the blood serum of a patient. A considerable amount of blood is needed for the examination, and this is to be obtained by removing the blood from a vein under aseptic precautions, and mixing it with liquid agar. The streptococcus pyogenes is the cause of most febrile puerperal states. The

colony that forms from the streptococcus pyogenes is surrounded by a round areola, of a white color, the areola of absorption, due to the absorption of the hemoglobin by the streptococcus. This is characteristic of the streptococcus pyogenes, and forms an important diagnostic sign. At every rise of temperature in a puerperal woman the blood is examined, as well as the lochia, on blood-serum agar. If, then, in a case of fever the plates show streptococci, the patient must be at once isolated, while many cases of fever that do not show streptococci may remain in the ward. One may also determine whether the inflammation is localized in the uterus, by demonstrating the streptococci in the lochia and not in the blood. Local treatment is then in order. If they are in the blood the prognosis is much worse. If the streptococcus is localized in certain points of the venous structure, the case is one of phlebitis, or metastatic abscesses. In these cases the culture of the blood is positive, but the streptococcus is not found in the uterus; the infection is general and intrauterine treatment is useless.

GYNECOLOGY AND ABDOMINAL SURGERY.

Hydrotherapy and Functional Disturbances of the Female Genital Organs.—Koblanck (*Berl. Klin. Woch.*, April 24) discusses the use of baths in functional disturbances of the genital organs in women. Amenorrhea he believes is not as often as has been thought the result of chlorosis. When there is true chlorosis chalybeate baths and nourishing diet should be used. Often it is the result of masturbation, and such treatment would render the patient worse. Here lukewarm, half and full baths are most useful. Massage is worse than useless, increasing the nervousness. In some cold baths are useful. The cause of menorrhagia is often imperfect coitus, due to withdrawal, or the use of condoms, producing a local congestion and even inflammation, the so-called noninfectious endometritis. Many late hemorrhages in the puerperium and after abortion are the result of coitus undertaken too soon. The decidua is not allowed to form a healthy mucous membrane, and an acute inflammation results. For all these conditions vapor baths, combined with intrauterine douches, are useful. Hydrotherapy is the most useful form of treatment. Sterility, when not of anatomical origin, may be treated by baths. Frigidity in the woman is generally the result of sexual excesses, but in the few cases of true frigidity carbonic-acid baths are useful, combined with physical and dietetic measures. Nervous symptoms due to functional derangements, or to retroflexion, are benefited. Parametritis retrahens posterior, when not the result of infection, is successfully treated by hydrotherapy. So also noninfectious öophoritis, with no adhesions and free tubes, but swelling and much pain and tenderness, gives a wide field for baths. Local treatment makes these patients worse, as do ordinary sanatorium methods, but bathing establishments teach them to be and to keep well. Of organic troubles, myoma of the uterus is benefited by baths, especially in plethoric women. Here a course of

sea baths will work wonders, even in anemic cases. If much depleted by hemorrhage such treatment is not applicable. When there are inflammatory lesions of neighboring organs, salt and mud baths are useful by removing the inflammation, reducing the size of pus tubes and removing adhesions. When the adnexa are not diseased the removal of blood from the organs should be attempted by the use of cold baths.

Purgation Before and After Operation.—I. S. Stone (*Amer. Med.,* Feb. 25) believes that excessive purgation should be restricted because it is enervating to the general system. It produces great irritation of the mucous membrane of the bowel. It may add to some of the dangers, as ilius and paresis. Purgatives have little effect in limiting the amount of the extraperitoneal exudate and fluids. Instead of calomel and saline purgation, bland evacuants, as castor oil, should be used before abdominal section. The use of suitable bland nonfermentative foods is desirable until just before operation in weak patients. After operation, limit peristalsis; give only small quantities of food and drink by mouth. Rarely give opium. Enemas should be administered to relieve distention and cause to peristalsis in downward direction. After normal peristalsis begins laxatives should be given as required.

Exploratory Operations Relating to the Kidney.—Howard Lilienthal (*Med. News,* Mar. 11) formulates the following indications for exploratory operation in suspected surgical diseases of the kidney: (1) Hemorrhage from one or both kidneys when other measures have failed to check the bleeding and the danger signals appear. (2) Palpable tumor with symptoms pointing to renal disease; sometimes even to establish whether the tumor is kidney, gall-bladder, or some other organ. (3) Existence of reason to suspect surgical renal disease, even in the absence of palpable tumor, when medical, hygienic, and local treatment fails to give relief. Exploratory incision may be necessary to demonstrate the condition of solitary kidney.

Cholelithiasis.—William J. Mayo and Charles H. Mayo (*Amer. Jour. Med. Sci.,* Mar.) have reviewed a series of 1,000 operations for gallstone disease with special reference to the mortality. In estimating the death rate they charge as a death from operation every patient who died in the hospital without regard to the cause of the fatality. In the 1,000 operations there were 50 deaths in the hospital, or an average death rate of 5 per cent. In the benign series there were 960 cases with 4.27 per cent. mortality. In the malignant cases, 9 deaths in 40 operations gave a mortality slightly in excess of 22 per cent. Where the disease was limited to the gall-bladder, including all nonperforating injections, the mortality was 244 per cent.; 573 cholocystotomies, mortality 2.46 per cent.; 186 cholecystectomies, mortality 4.3 per cent. Of the common duct operations there were 137 benign, with 16 deaths, 11.7 per cent. There were 40 malignant cases, with 9 deaths in the hospital; of those who recovered few received sufficient palliation to repay the immediate risk, suffering, and expense. Two cases

of early carcinoma of the gall-bladder can be considered as cures, having shown no return in two years. Other things being equal, all cystic gall-bladders should be removed, especially when a stone is impacted in the cystic duct, as not infrequently a stricture may follow its removal, interfering with the escape into the common duct of the normal secretion of the mucous membrane. As a rule, all gall-bladders which are found to contain bile at the time of operation may be drained, as it shows that the cystic duct is patent. If the cystic duct is considerably injured during removal of the calculus, introducing doubts as to its future permeability, remove the bladder. Gall-bladders suspiciously thick should be removed, as early malignant disease may thus be cured. In most cases of chronic cholecystitis without stones, excise the gall-bladder. When stones are present, giving rise to irritation, their removal and drainage may be expected to give relief, but an infection which can continue without the aid of foreign bodies, calls for the more radical operation. Before a diagnosis of non-calculus cholecystitis is permissible, the duodenum, stomach, pancreas, appendix, and right kidney must be examined, and if the theory is correct the gall-bladder should be found thickened, of light color, with the lymphatic glands along the cystic and common ducts markedly enlarged. It should contain tarry bile and the mucous membrane should be not only thickened, but covered with little fibrinous specks. In patients with gallstones, who have suffered from jaundice and other symptoms of infection of the common and liver ducts but without stones in the ducts, perform cholecystotomy, as it furnishes bile drainage. If cholecystectomy is performed in these cases the duct must be left open, or, if necessary, split down to the common duct, as drainage may be vital in such cases. The most common cause of death where the gall-bladder alone was involved has been a descending infection of the common and hepatic ducts. The mortality of choledochotomy depends almost entirely upon two factors, jaundice and infection. About one-third of all patients with common duct stones have little or no jaundice at the time of operation. However, it will usually be found that at the time the stone passed into the common duct there were both jaundice and infection. During the quiescent period operation is safe in such patients, and the mortality not more than 2 per cent. Unfortunately, the majority of common-duct patients have either never had an intermission or have passed beyond it, and the operation must be done to save life, no matter how desperate. All those patients, in the experience of the writers, have died who had obstructive jaundice with no trace of bile in the bile passages, the liver having been put out of action. In a number of cases this condition was met with at an earlier stage; of these, about one-half recovered.

Ovariotomy.—After reviewing the literature on ovariotomies performed on patients under 10 and on those 70 years or over Harry T. Wiel (*Johns Hopk. Hosp. Bull.*, March) reaches the

following conclusions: (1) Age is no contraindication to operation in these cases. (2) The prognosis is extremely favorable in those of advanced years, even in the most aged. In the very young it is not so favorable, but is nevertheless good. (3) Malignant ovarian tumors are rare in the aged, but more common in the young, this greater frequency accounting for the greater mortality. The most frequent ovarian tumors in the aged are benign cysts, particularly the multilocular variety. These tumors are comparatively rare in the young. Ovarian dermoids and sarcomata are the most frequent ovarian tumors in the young and the rarest in old persons. The writer reports a case of adenocarcinoma of the ovary, successfully operated upon, occurring in a patient 5 years old.

Ovarian Cysts.—A. R. Simpton (*Scot. Med. and Surg. Jour.*, April) cites three cases which tend to confirm the hereditary nature of this disease. These cases occurred in a mother and two daughters, all of whom were operated. In regard to ovarian cystoma, the possibility of descent can attach only to the maternal predispositions, so that the chances of hereditary transmission are greatly lessened, and there is no possibility of intensification from the male side. As it is the germinal glands themselves that are the seat of the disease, their involvement lessens the power of reproduction, so that married women who suffer from ovarian cystoma are barren in the proportion of one in three or four.

Fibromyomata.—F. W. Nicol Haultain (*Scot. Med. and Surg. Jour.*, April) advises hysterectomy for the majority of interstitial and subperitoneal fibroids which give rise to symptoms and reduce a woman's health, comfort, and usefulness, when under 45 years old; in all cases where urgent symptoms are present, at any age, when myomectomy cannot readily be performed. When no symptoms are present, no treament is necessary, and it is unwise to acquaint the patient with the facts.

Adenoma Hemorrhagica.—William Alexander (*Brit. Gyn. Jour.*, Feb.) reports five cases of adenoma hemorrhagica of the endometrium. The chief symptom in all these cases was persistent hemorrhage recurring after curetting and after all treatment; not so great as to destroy life, but sufficient to keep up a condition of invalidism. The size of the uterus and the curettings presented nothing pathological. All the patients were over 34 years of age, and all had hysterectomy performed with good results. After removal the uterine cavity presented very distinct and uniform features in a thick, semi-gelatinous, semi-fibrous membrane, running into folds or polypoid masses, affecting the who mucous membrane of the uterus and beginnings of the Fallopian tubes. Bowseman Jessett, alluding to the gelatinous condition of the uterine mucus membrane, said he had not the slightest doubt that it was a precancerous condition.

Tubercular Peritonitis.—From the facts and observations set forth by William J. Mayo (*Jour. Amer. Med. Assn.*, April 15)

he thinks we are justified in the belief that the failure of simple laparotomy and evacuation of the fluid exudate in tubercular peritonitis to maintain a high place in surgery is due to reinjection from lesions in the mucous membrane of the Fallopian tube, appendix, or some part of the intestinal tract. We have been treating a symptomatic peritonitis instead of removing the source of the disease. In many cases the infecting lesion cannot be discovered, and it is equally true that not all cases can be explained in this way. Experience teaches that under expectant treatment many of the primary lesions are cured by natural processes. Simple laparotomy and drainage aids recovery in a remarkable manner. Radical operation on the primary lesions in tubercular peritonitis will greatly increase the percentage of cures and prevent reinfection of the peritoneum. It seems reasonable to suppose that tuberculous peritonitis has its origin in a local focus in practically every case.

DISEASES OF CHILDREN.

Absorption, Elimination, and Utilization of Salt in the New-born.—M. L. Pierra (*Bull. de la Soc. d'Obstet. de Paris,* March 16) describes experiments made by him on the absorption and utilization of common salt by young children, with a view to determining the effect of injections of normal salt solutions on the human system. His observations included six healthy infants, about one month old, and covered a period of five days, during which all the feces and urine were collected and examined. They were nursed entirely, taking no other food. The results are these: In the nursing child the absorption of salt is very small, since there is a very small quantity of salt in the milk. The salt is eliminated mostly by the urine, secondarily by the feces. The amount eliminated daily in the urine was gm. 0.1437. There were considerable individual variations. In the feces there was eliminated each day gm. 0.0208. There was retained daily gm. 0.0965 of sodium chloride. Hence there can be little assimilation of salt by the infant.

Digestion of Caseins.—T. S. Southworth (*Med. Rec.,* March 4) says that the discoveries of Van Slyke and Hart have shown that no gastric digestion by pepsin takes place until calcium casein, the form in which casein exists in combination with calcium in fresh cow's milk, and calcium paracasein, the clot produced by the action of rennet on fresh milk, have been acted upon by acid and converted into free casein or free paracasein, or their compounds with acid. The rennet ferment acts upon calcium casein forming calcium paracasein, a soft clot. If no acid is present this passes into the intestine and is readily digested by the intestinal and pancreative secretions. Pepsin will not attack calcium paracasein in the absence of acid. When hydrochloric acid begins to be secreted by the stomach this reacts with the calcium paracasein formed by the action of the rennet ferment, making first free paracasein and then a definite chemical compound known as hydrachloride of paracasein which is fitted for gastric digestion and is now readily attacked by pepsin, and true stomach digestion begins. The ten-

dency of the curds of free paracasein and free hydrachloride of paracasein to shrink and become tough is especially marked in cow's milk. Milk which itself retains practically the same composition throughout lactation is changed by the action upon it of the developing gastric secretions into forms and compounds which require at first moderate, and later more extended gastric digestion. If the stomach secretes a small amount of acid, little of the soft calcium paracasein clot is changed into free paracasein. The latter is readily soluble in dilute saline solution, which explains the good results claimed from addition of a little salt to the infant's bottle. With such moderate secretion of acid only part of the calcium paracasein is prepared for gastric digestion and the rest passes into the intestine and is there readily digested. The regulation of the work performed by the stomach is thus automatic. When hydrochloric acid is present in amounts greater than is necessary to form free paracasein with those parts of the calcium paracasein clot which it can readily attack, depending upon the size and density of the curds, the excess of acid unites with some exposed portions of the free paracasein to form hydrochloride of paracasein. Such a salt of paracasein is more difficult to digest in the absence of uncombined acid in the stomach than free paracasein, but when there is acid enough secreted by the stomach to also give free acid, the acid compounds of paracasein are more readily digested by pepsin. If milk which has begun to sour from the development of lactic acid, but has not yet curdled, is taken into the stomach where it meets with rennet, even in the absence of hydrochloric acid secretion, the rennet ferment will attack it, forming curds which rapidly turn into tough curds of free paracasein and lactate of paracasein. The same results occur from the development of lactic acid forming bacteria in the stomach if they are numerous in the milk when ingested. The addition of this lactic acid to the normal hydrochloric acid may increase the quantity of tough curd beyond the powers of gastric digestion, and these curds being unfit for intestinal digestion, cause colic and other disturbances. This explains the pernicious results from unpasteurized or modified milk when kept for a considerable time at a temperature above 60° F. If souring of milk has advanced outside the body to the point of complete curdling with the formation of very finely divided curds of lactate of casein (not paracasein), as in buttermilk, the rennet ferment has no action on these curds when the milk is ingested and the formation of tough acid paracasein curds is prevented. Such a compound of casein with acid is less tough and more finely divided, and, therefore, to this extent at least, more digestible than the corresponding compounds of paracasein with acid. Such facts probably account for the dangerous qualities of partly soured hilk, while buttermilk, clabber ,etc., are more digestible. Pasteurization has an indirect influence upon the digestibility of the calcium casein of cow's milk, in that by destroying the lactic acid germs, and preventing the formation of lactic acid, it allows the hydro-

chloric acid of the stomach alone to form combinations with the calcium paracasein, and the free paracasein and hydrochloride of paracasein which are thus formed will more probably be in proportion to the amount of pepsin secreted. The smaller the amount of casein in the food, as in very dilute mixtures, the greater will be the relative proportion to it of hydrochloric acid in the stomach.' This excess would tend to form the tough curds of hydrochloride of paracasein. The addition of more milk, to a reasonable degree, would tend to cause formation of softer curds of free paracasein. This shows why small amounts of more concentrated food may succeed when very dilute mixtures in larger amounts have failed of digestion.

Lesions of Upper Air Passages Due to Hereditary Syphilis.—J. Clarence Sharp (*Arch. of Ped.*, March) gives a course of antisyphilitic treatment to all young children with hypertrophy of the cervical and submaxillary nodes. Under this treatment the glandular hypertrophy disappears and the children begin to improve mentally and physically. This fact is not believed by the writer to prove that all children with enlarged cervical nodes are syphilitic, but many of them are. Abscesses of the lymph nodes, or even gummata in the upper air passages, may form, and these conditions are apt to lead to a diagnosis of tuberculosis. The only evidence of hereditary spyhilis may be a roughened and corrugated tongue with white patches. Hutchinson teeth are found by the writer is not more than 1 or 2 per cent. of children with this disease. He considers many postpharyngeal abscesses as due to hereditary syphilis.

Retarded Development of Speech in Young Children.—G. Hudson-Makuen (*N. Y. Med. Jour. and Phila. Med. Jour.*, March 4) says that retarded development of speech in young children may be the result of structural irregularities in the peripheral organs, to impaired respiration due to nasal, postnasal, and pharyngeal obstructions, to paresis of the nerves supplying the organs of speech, and not infrequently to some disturbance of hearing not necessarily amounting to absolute deafness. Retarded development of speech always results in defective mentality. The treatment consists in the removal of any obstruction that may exist in the peripheral organs and in the systematic training of the auditory and speech centers by the use of special vocal exercises. A child may be taught to hear in exactly the same way that he is taught to read and write.

Developmental Disturbances, Fetalism and Infantilism.—Alfred Hegar (*Münch. Med. Woch.*, April 18) discusses two forms of lack of proper development, in the fetus and in the infant. Growth includes change in form, differentiation, and increase in weight and circumference. Differentiation may cease while growth goes on; or increase in size may be limited and differentiation go on, as in the dwarf. Cessation of growth in the fetus, as in abnormal development of the genital organs, of the hip joint, or of the pelvis, is termed fetalism. Lessened growth in the infant constitutes

infantilism. They may be combined in an individual. The cause of both forms of anomaly is further back than the last months of pregnancy, in the nature of the germ, but it is aided in the infant by lack of mother's milk, improper nourishment, infectious diseases, such as syphilis and tuberculosis, and the changes of puberty. The results of fetalism are many; one is the infantile uterus. There may be disproportion between cervix and fundus; some segments only may be undeveloped; the fundus may be flat, rising little above the orifices of the tubes; the supravaginal segment may be too narrow, or the vaginal portion may be small, conical, long. The condition may be accompanied by normal ovaries and tubes, as well as pelvis, and a capacious vagina. There may also be a uniformly contracted pelvis of infantile form, or a large pelvis of the infantile type, similar to the male pelvis. Another anomaly is the infantile breast, small and with undeveloped nipple, areola, etc. A result of lack of uterine development may be amenorrhea, lateness, irregularity, or absence of menstruation for months at a time; or short, scanty menstruation, or menstruation lasting two weeks, but small in amount. An early climacteric may result. Sterility is another symptom, and anteflexion may be present. The proportion between cervix and fundus may be normal, but the entire organ diminutive. Pregnancy does occur in these uteri, development appearing to take place after connection to a certain extent. In these vases dilatation in labor is slow and painful, as long as five or six days. Abortion may occur instead. The author believes that rigidity of the cervix is often due to lack of development of the uterus. Other portions of the body besides the uterus bear the marks of lack of development; the bones may be small and slender, the skull misshapen, the jaws narrow, alveolar processes undeveloped, lower jaw overlapping the upper, chin receding, teeth badly formed and irregular, too close together, or too far apart. The ribs may be malformed, so as to decrease the size of the chest, and predispose to tuberculosis. Lordosis may occur; in cretins there is seen failure of ossification between epiphysis and diaphysis. There is also hypoplasia of the heart and aorta; absent, small or displaced kidneys, even descending into the small pelvis, abnormal ureters. The sense organs may be defective, the external ear malformed; in cretins deaf-mutism; eyes with coloboma, eccentric pupils, squint. The functional results of defects of the nervous system are well known; especially neurasthenia of severe form, chorea, epilepsy, hysteria, failure of mentality and moral sense, instability of mind. Chlorosis may occur from failure of action of the blood-producing organs. Operative procedures to remedy these conditions of the uterus, sterility, etc., are useless, and medicines are equally unavailing.

Influence Upon the Child of Sexual Incontinence During Gestation.—Ch. Féré (*Jour. de Méd. de Paris,* May 14) combats the popular opinion that marriage sanctions all sorts of sexual indulgence, and that connection during pregnancy is justifiable, and acts as a preventive of too frequent childbirth. It does, indeed,

often produce abortion or premature labor, but it also injures the product of conception incalculably in its nervous development. To support this view he cites a case in which daily cohabitation was practiced from the moment that pregnancy was recognized, as a preventive of a large family. Only one child was born to this couple, and he was afflicted with serious nervous disturbances. After this child there were two children born dead, one at eight months, one at seven, and one abortion at two months. No syphilitic history could be obtained. The child that lived was epileptic and had many stigmata of degeneration. He had convulsions as a baby, vertigo, nocturnal terrors, incontinence of urine, hallucinations of all the special senses, violent attacks of anger, and epileptic attacks. The author ascribes the origin of these troubles to the lack of nerve strength transmitted to him by his parents, on account of their sexual excesses. He enjoins on all married couples complete abstinence from sexual intercourse during pregnancy.

Baths in Therapeutics of Children.—O. Heubner (*Ber. Klin. Woch.,* April 24) recommends the use of saline and sea baths in scrofulous children, provided a good reaction is obtained, which should last at least half an hour after the bath. He made observations on two scrofulous children, in fair health, during a period of 27 days—10 days before treatment, 11 days while bathing, 6 days afterward. The urine and feces were collected, and the balance of the elimination and intake of nitrogen estimated. The baths were at first warm; the percentage of salts was increased gradually until it produced slight burning of the skin. He found that in both cases the weight was somewhat increased; chlorides were retained, nitrogen was increased during the baths and decreased during the entire period of treatment. He concludes that the elimination of nitrogen is influenced by the use of saline baths in children. The salts increased the metabolism of the body. There was a temporary blanching of the child's skin, a wrinkling and coolness of the extremities, and a pulse that was small. The frequency of the pulse was not changed. There was no effect on the temperature. Reaction was good, and the skin became red and slightly turgid. The action of the vasomotor nerves of the skin was increased. Hence, saline baths aid metabolism in two ways, by increasing the elimination of nitrogen, and by action on the peripheral and vasomotor nerves. It will aid the elimination of pathological products. That a good reaction should be obtained is most important. There should be rest after the bath, the appetite should increase, and the body weight should not decrease. Sea baths have practically the same effect. It has been found that in children the effects of saline baths on uncompensated organic heart lesions are good, increasing compensation. Sulphur baths should be of value in syphilitic cases. Baths should also be useful in functional and some organic paralyses.

Treatment of Curvatures of the Tibiæ by Manual Osteoclasis.—T. H. Openshaw (*Lancet,* March 4) advocates manual fracture of

the tibia at the point of greatest curvature, by firm and increasing pressure upon the bone at each side while the curved portion of bone rests upon a rubber-covered edge of a block. He regards it as superior to cuneiform osteotomy, as the bone is broken exactly at the spot and along the plane which are proper, while there is none of the difficulty of estimating the size of the wedge of bone necessary to remove, the bone is lengthened instead of shortened by excision, and there is a simple greenstick instead of a compound fracture to be united.

Acute Intussusception in Infants.—E. W. Peterson (*Med. Rec.,* March 4) reports a successful operation for acute intussusception of about 30 hours duration in an infant of 4 months and 20 days. While in good health, it suddenly became very ill, with paroxysmal colicky pains, tenesmus, frequent discharges of blood and mucous after only one fecal movement, vomiting, fever, and collapse. The ileum, appendix, and cecum were invaginated into the colon and gangrene had begun. After resection of this portion, and end-to-end anastomsis of the ileum and ascending colon was done. On the fourth day the Murphy button was found at the anus.

Acute Pyelitis of Infancy.—This affection is rarely reported, but of sufficient importance to demand attention. Rowland G. Freeman (*Arch. of Ped.,* March) describes a case occurring in a male child 8 months old. The attack was preceded by slight digestive disturbance for a few weeks and some evidence of urethral irritation. Temperature was irregular for nearly three weeks, then constantly high, with nervous symptoms, such as twitchings and stiffness of the neck. Urine was acid, contained much pus, and a few hyaline casts. A culture from the urine showed the bacillus coli only. Under urotropin at intervals and citrate of potassium improvement was rapid and continuous. As a large proportion of these cases occur in female infants, it is probable that the infection is through the urethra, while the usual association of the bacillus coli communis points to infection from the alimentary tract, as does the fact that many cases follow intestinal disorders. The clinical manifestations give no indication that the renal pelvis is the source of trouble, and urinary examination is often neglected on account of the difficulty of obtaining a specimen.

Sclerema Neonatorum.—J. Sobel (*Arch. of Ped.,* April) records a case of this affection in the premature and feeble child of a poorly nourished woman. At, or soon after, birth there was observed firm symmetrical induration of the skin and subcutaneous tissue of the shoulders, arms, chest, abdomen, and back, not pitting on pressure. There was no cardiac disease. The affected skin could not be raised from the subcutaneous tissue, or this from the deeper parts. The calves were not involved nor was the face. Inunctions of mercurial ointment, then hot baths and massage with sweet oil were employed. Recovery.

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ORIGINAL COMMUNICATIONS.

A REPORT OF SEVEN CESAREAN SECTIONS.*

BY

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Six of the following cases occurred in July and August, 1901, 1902 and 1904, during my summer service at the Sloane Maternity Hospital. The seventh, a private case, was operated upon there in March, 1905. They seem of sufficient interest to warrant reporting.

Case I.—Mrs. D., a primipara, 38 years old, born in the United States, was admitted to the Sloane Maternity Hospital on June 11, 1901, seven and a half months pregnant. She had a marked kyphosis dating from childhood. The pelvis measured twenty-seven cm. between the spines; 28.50 cm. between the crests; 21 cm. for the right oblique; 22 cm. for the left oblique; 18.25 cm. for external conjugate, and 9.25 cm. for the internal conjugate. These diameters were very good, but the contraction as it always is in such pelves was at the outlet. Here between the tuberosities of the ischium there was a distance of 7.50 cm.;

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between the tip of coccyx and lower margin of the symphysis it measured 7 cm. Allowing for the natural changes which take place in the pelvic joints, for the tilting backward of the coccyx, for the moulding of the head, for the size of the child, and for the fact that so many women with kyphotic pelves can be delivered, even at term, at most by a low forceps, it was decided at eight and a half months to induce labor. On July 12th, 1901, at 6 P.M., therefore, a No. 2 modified Champetier de Ribes balloon was inserted into the cervix. For forty-eight hours the pains were very weak and there was little progress. Even after the largest bag had passed through the cervix and the membranes had been ruptured, the pains were irregular and ineffective. The head only dipped into the pelvic brim.

On July 16th there was no change. A version or a symphyseotomy being out of the question, and, as by forceps the outlook for a live child was very doubtful, Cesarean section offered the best solution. The conditions, however, were not the most favorable. Eighty-four hours had elapsed since the first bag had been introduced into the cervix, the patient was all tired out, her pulse was 130, and there had been numerous examinations and much manipulation by vagina. A Sänger operation was performed. The child was delivered in sixty-one seconds. The whole operation lasted thirty-eight minutes. The mother had a reactionary temperature of 103° F. on the first day. Otherwise her convalescence was uneventful. The baby weighed at birth five pounds six and a half ounces. At the time of discharge from the hospital, when four and a half weeks old, it had gained to seven pounds and two ounces on its mother's breast milk. When ten weeks old, it weighed twelve pounds. At three years of age, the child was a fine, healthy boy.

In a study of this case, we should be surprised that the patient did so well after such a long labor and after so many chances for infection—such as the introduction of a series of balloons into the cervix and many vaginal examinations. It was a case where many obstetricians would have ruled out a Cesarean section for fear of sepsis. This case also shows that we cannot positively determine whether a premature child at a certain age can be born spontaneously or by an easy forceps. We can give the patient a trial, however, by inducing the labor, but at the same time we must be prepared for a major operation.

CASE II.—Mrs. M., age 29 years, a quartigravida, born in Russia, was admitted to the Sloane Maternity Hospital July 4th,

1902. Her three previous confinements had been terminated by a craniotomy. She was eight months pregnant. The membranes had ruptured and the pains had started several hours before admission. The pelvic measurements were as follows: Interspinous diameter, 25.50 cm.; intercristal, 27 cm.; right oblique, 21 cm.; left oblique, 20.50 cm.; external conjugate, 18.50 cm.

By abdominal examination the head was thrown over to the right side, riding 5 cm. above the symphysis. In the left iliac fossa a large, hard mass, extending one-quarter of the way to the navel was detected.

By vagina this mass almost entirely occluded the pelvic brim, reducing the internal conjugate to less than 5 cm. It was cartilaginous, or bony, apparently arising from the sacrum with a very broad base. Over the tumor the finger could just pass close to the symphysis and high above, with difficulty, the cervix was felt. A diagnosis of an enchondroma or an osteoma was made. From the symphysis a small exostosis ½ cm. long projected backward. A Cesarean section was absolutely indicated.

An incision 10 to 12 cm. long above and below the navel was made. The uterus was incised in situ and the child extracted in fifty-seven seconds from the time of the first incision. The uterus was then delivered through the abdominal wound, and the following conditions were found. The uterus as it lay was rotated half way round on a vertical axis to the right, and so forced out of place, that the incision had been made chiefly in the cervix and the lateral wall of the lower uterine zone very much over to the left. In extracting the child, the tear had extended the lower edge of the incision still further down into the cervix and into the peritoneal coat of an adherent loop of sigmoid. The lower edge of the cervical tear was sutured by catgut and the peritoneum covered over it. A supravaginal hysterectomy was then done. The duration of the operation was one hour and eighteen minutes.

The patient developed a stitch abscess and a moderate cystitis with a temperature of 103° F. on the second day. There was a moderate fever until the seventh day, after which she rapidly convalesced.

The infant, a boy, weighing four pounds and fourteen ounces at birth, had gained to seven pounds one and a half ounces on its mother's milk at the time of discharge from the hospital. In August, 1904, the baby had grown to a vigorous child, two years old. The mother had suffered from time to time with cystitis. The tumor seemed unchanged in size.

In this case the displacement and rotation of the uterus should be noted, also the fact that the lower segment of the uterus was incised, although the upper end of the abdominal incision had been made well above the umbilicus. In the histories of the Sloane Maternity Hospital, I can find no similar cause for dystocia—a bony or cartilaginous tumor obstructing the pelvic canal. How a child could have been delivered previously by a Craniotomy can only be explained by a marked growth of the tumor since her last confinement.

Case III.— Mrs. H., aged 38, born in Ireland, pregnant for the sixth time, was admitted to the Sloane Maternity Hospital on August 23d, 1902, one week before term. Her first four confinements had occurred at the Sloane Maternity Hospital, and the fifth at the City Hospital. The following was her history:

For her first delivery she was brought to the hospital in an ambulance on September 9th, 1889, after having been in labor thirty-two hours. A transverse presentation had been converted into a face by doctors outside, and on admission the face was impacted in the pelvic brim. A craniotomy was done six hours later, extracting the child, weighing seven pounds eight ounces.

For her second confinement she came to the hospital February 10th, 1891, after thirteen and a half hours of labor. It was a vertex presentation, with the head riding high above the brim. By vagina a pulseless prolapsed cord was detected. After several hours of labor without progress a craniotomy was done. The child weighed eight pounds thirteen ounces.

For her third pregnancy, labor was induced at eight months and one week, March 24th, 1893. After sixteen hours of labor, a high forceps was tried and failed. By means of a difficult version, the child was extracted alive but with a broken arm. It weighed five pounds nine ounces. It was deeply asphyxiated at birth and died on the second day from a cerebral hemorrhage.

Her fourth pregnancy was induced at eight months and two weeks, April 28th, 1894. This child, weighing six pounds nine ounces, was delivered dead by means of a high forceps.

In her fifth pregnancy she became insane, and was transferred to the City Hospital. She was there delivered of a six-months' macerated fetus.

The patient was very anxious for a living baby, although she had a presentiment that her own life would be sacrificed for it. The pelvic measurements were as follows: Interspinous diameter, 28 cm.; intercristal, 29 cm.; right oblique, 21.50 cm.; left

oblique, 22 cm.; external conjugate, 18.50 cm.; internal conjugate, 8 cm.

The indication was for a Cesarean section, and the day was set for August 26th, 1902, five days before term. At 4 A. M. on this date a No. 3 modified Champetier de Ribes balloon was inserted into the cervix. Pains soon started. At 1 P. M. the cervix was dilated to about four fingers. A Sanger operation was then done. The child, weighing seven pounds one and a half ounces, was delivered in two minutes. The operation was an easy one. There was no shock, and the patient had the smoothest convalescence possible until the fifth day, when in the afternoon the temperature rose to 100.6° F.

On the sixth day, the temperature was 102° F. in the afternoon. The abdominal wound seemed perfectly normal, and there was no tenderness. On the seventh day, the temperature did not rise above 100.4° F.

On the eighth day, however, it jumped to 103° F., the pulse rising to 130. Two stitches were removed from the lower angle of the wound. A pocket of pus was found. This was cleansed and drained.

On the ninth day the temperature was 102.6° F. Besides irrigating the wound, an intrauterine douche was given. The temperature then fell to normal, and remained so till the thirteenth day, when it suddenly rose to 105° F. The patient now seemed very sick. There was repeated vomiting, delirium, and pain in the head. The pupils were unequal and unresponsive to light. There was no abdominal distention. She was seen in consultation by Dr. Joseph A. Blake, who advised a hysterectomy, which operation was at once performed. The uterus, however, showed no signs of suppuration, and there was only a localized peritonitis about the abdominal and uterine wounds. The patient became comatose after the operation, with a continued pyrexia, and died thirty-six hours later.

Autopsy.—No peritonitis except local: no pus collection in or about the peritoneum. The kidneys showed chronic nephritis and one infarct in the left one. There were two infarcts in the lower lobe of the left lung. The cortex and meninges of the brain were covered by plastic lymph and pus. Cultures from the abdominal wound, meningeal exudate and the spleen showed the staphylococcus pyogenes aureus; there were also a few of these cocci found in a culture from the uterus.

Diagnosis.—Pyemia.

The baby did well, and was discharged in good condition on the nineteenth day.

This case was a great disappointment to all interested—a woman whose previous obstetric history was a chapter of horrors, and who did not fear the coming ordeal, even with the presentiment of impending death. It was the most selected case of all, and for the first few days the outlook was most favorable. Why she should have developed a purulent meningitis, and a pyemia, from a stitch abscess of the abdominal wound so long after the operation, no one can explain. Possibly the vulnerability of the meninges was increased by some previous trouble in those membranes during her fifth pregnancy. It was certainly due her that she should enjoy the motherhood which she had finally obtained. There must have been some error in the technique to cause the infection, but as much time and care were given to her preparation as to any other Cesarean section performed at the hospital. Such a result would tend to make one less radical for this major operation. I regret that I did not wait till labor had commenced before operating.

Case IV.—Mrs. C., a primipara, 30 years of age, born in the United States, was admitted to the Sloane Maternity Hospital September 1, 1902, having been in labor sixteen hours and forty minutes. The child was large, lying in the L. O. A. position, with the head above the brim. The pelvic measurements were as follows: Interspinous diameter, 20 cm.; intercristal, 24.50 cm.; left oblique, 19 cm.; right oblique, 18.50 cm.; external conjugate, 22.50 cm. On obtaining her history, it was found that when six months old she had had two abscesses in the back, which had been opened. These abscesses had undoubtedly involved the sacro-iliac joints, as scars could still be detected over them and as the pelvis had the extreme narrowness which goes with non-development of the alæ of the sacrum. The patient was rather tall and well-developed otherwise.

By vagina, two fingers could be passed side by side between the tuberosities of the ischum, so that the diameter only measured about 3 cm. The cervix could be felt, but the os could not be entered by the examining finger. A diagnosis of a transversely contracted pelvis similar to the Robert type was made. The indication, therefore, for a Cesarean section was absolute.

The child was delivered in one minute and forty-one seconds from the first incision, the placenta being encountered in the

uterine wound. A supravaginal hysterectomy was then performed.

The mother did very well, save for post-operative paresis of the bowel, and temperatures of 100.8° F. on the seventh day and 103° F. on the thirteenth day, the last rise probably due to a mastitis. The baby weighed eight pounds one ounce at birth, and at the time of discharge, the thirtieth day after birth, it had gained to nine pounds five ounces on its mother's breast. At five months, the child was the picture of health.

Here the indication for the operation was unique. The pelvis was not strictly a Robert pelvis, although the result of the early involvement of the sacroiliac joints produced a pelvis of this type—extremely contracted in the traverse diameters. Very few pelves of this variety have been reported, and this is the only one in the records of the Sloane Maternity Hospital. With our more recent ideas about repeated Cesarean sections, I am sorry I removed the uterus.

Case V.—Mrs. M., colored, pregnant for the second time, twenty-two years old, was admitted to the Sloane Maternity Hospital August 18th, 1904, in the first stage of labor. The membranes were ruptured. The child was very large, with the head riding high above the pelvic brim.

Her history was as follows: She was fed on breast milk, but did not walk until four years of age. She had been delivered of a child weighing six pounds eight ounces at the Sloane Hospital on April 1, 1903, after a short labor. The baby died on the fourth day from atelectasis. From the second to the fifth day, she had a mild infection, which yielded to intrauterine douches. The highest temperature was 102.6° F. The patient showed evidences of extreme rachitis. Her height was five feet. She had a pronounced lordosis, a richety rosary, and Harrison's groove was somewhat marked. The long bones were enlarged at the epiphyses, and there was an anterior and outward bowing of the lower third of both tibiæ. Her pelvic measurements were as follows: Interspinous diameter, 23.50 cm.; intercristal, 23 cm.; right oblique, 19.25 cm.; left oblique, 18.75 cm.; external conjugate, 17 cm.; internal conjugate, 7.75 cm.—a typically flat richety pelvis.

The child was so large that a delivery per vias naturales was considered impossible. A Sanger Cesarean operation was done, lasting one hour and two minutes. The baby was delivered in one minute and fifty-four seconds. The placenta was under the

uterine incision, and there was considerable bleeding. This was due to the fact that the uterine wall was very soft, and because the tissues bled at each needle puncture. Her pulse was 130 before the operation, and ran about 150 afterwards, at the same time being small and weak. It soon responded to stimulation and saline infusions by rectum.

On the second day there was some distention of the abdomen and vomiting of brown fluid streaked with blood. The temperature rose to 102.4° F. On the afternoon of the third day there had been no result from cathartics and enemata. At 3.30 P. M. the patient had a chill, followed by a temperature of 105.2° F. An intrauterine douche was given through a contracted cervix and considerable retained discharge was washed out. The uterus was then tamponed with iodoform gauze. That evening the bowels moved and during the next morning the temperature fell to 99.4°F. There was considerable stenosis of the cervix, causing such poor drainage that the patient ran a temperature every afternoon until the fourteenth day—on the sixth day rising as high as 104.6°F. The abdominal wound healed by primary union. The mother was discharged at the end of the fifth week in good condition. The baby weighed eight pounds and eight ounces at birth. It gained but slowly to eight pounds and fourteen ounces, partly on the breast and partly on modified milk.

Case VI.—Mrs. McB., thirty-four years old, born in Ireland, pregnant for the third time, was admitted to the Sloane Maternity Hospital on August 16th, 1904, one day before the term. She gave this history: She had walked early and when twelve years of age had to go to work. She was required to carry heavy bundles on her back. She had had a normal premature labor at eight and a half months. The child weighed between six and seven pounds, but died when eighteeen months old from "bowel trouble."

Her second child was delivered at term by a craniotomy. The pelvic measurements were as follows: Interspinous diameter, 26 cm.; intercristal, 27.50 cm.; right oblique, 20.50 cm.; left oblique, 20 cm.; external conjugate, 17.50 cm.; true internal conjugate, 8.25 cm.; false conjugate, 7.75 cm. The head was riding high above the brim and seemed very large and hard. The pelvis was of the flat-justo-minor variety. With this history it was decided to do a Cesarean section after labor had started in. Pains commenced August 18, at 5 A. M. At 3 P. M. they were strong and the cervix had quickly dilated. A Sanger-Cesarean was done on

the same afternoon, and immediately after Case No. 5 had been operated upon. The child was delivered in one minute and twenty-five seconds. The placenta was at the site of the uterine incision, but there was little bleeding. The whole operation lasted forty minutes.

The mother did beautifully until the seventeenth day, when she developed a mastitis with a temperature of 102.2°F. This resolved, however, very quickly. The baby weighed seven pounds, thirteen and a half ounces at birth. At the time of discharge on the thirty-third day it had gained to nine pounds, thirteen and a half ounces on its mother's milk. At seven months it weighed twenty-four pounds, a fine, healthy child.

These two cases are similar to those often encountered. A woman with a contracted pelvis, especially a flat pelvis, will give birth to her first or to a premature child without any trouble. The head, as we all know, often engages early in a primigravida. If the head, therefore, gets below the contracted brim of a richety pelvis, the obstruction has been passed and the birth is easy. Again, if the baby is small, and especially if it is premature, with a soft, easily mouldable head, strong uterine contractions will force it through the flattened brim in time without assistance. When these patients, however, go to term for a subsequent pregnancy, the head rides high, is larger, and harder, and the delivery of a live baby through the pelvic canal is impossible.

In Case V, how a small premature child, even, was born spontaneously seems very remarkable, for the pelvis and the whole bony anatomy of the woman showed the results of an extreme rachitis. I imagine this patient had a gonococcus infection besides the poor drainage from the uterus, which accounted for her temperature.

In Case VI, a previous craniotomy, at full term, gave evidence for the positive indication for the Cesarean section.

Case VII.—Mrs. B., a primipara, thirty-six years of age, was born in the United States.

Her previous history was entirely negative. The patient never wore corsets. She was first seen by the writer on Febuary 11, 1905, when pregnant eight and a quarter months. She stands very straight and there is an apparent lorodosis in the lumbar region. Her pelvic measurements were as follows: Interspinous diameter, 24 cm.; intercristal, 27 cm.; right oblique, 22.50 cm.; left oblique, 22.25; external conjugate, 22 cm. The head in a L. O. A. position seemed large and rode high (at least 5 cm.) above the symphysis. The vagina was very narrow; the cervix was closed,

long and firm. Neither the head nor the promontory of the sacrum could be felt by vaginal examination. Fearing trouble at the time of delivery, even though the pelvic measurements were good, she was ordered strychnine three times a day and long walks daily.

On February 28 there was no change, even though within three days of term. She was then seen in consultation by Dr. E. B. Cragin, who, with the writer, considered the case a poor one for induction of labor on account of the long rigid cervix, and advised waiting for the physiological changes which take place in the soft parts prior to the onset of labor.

March 14, two weeks later, one finger could be forced through the cervix. She was then seen in consultation by Drs. E. B. Cragin and S. W. Lambert and an examination under ether was made. The promontory could not be palpated, yet the head was riding high above the brim. It seemed, therefore, advisable to start the labor, with the hope that with strong pains the head could be moulded through the pelvis. A No. 2 modified Champetier de Ribes balloon was inserted into the cervix. At 9 A. M. on March 15, twenty-four hours later, there were no pains; the bag was then pulled through the cervix and a No. 4 (the largest size) inserted. In a short time the pains started but were very weak. In seven hours the bag came through the cervix and a bougie was inserted into the uterus. The pains now became stronger and more frequent. At 9.15 P. M. the membranes ruptured. At 1 A. M., on March 16, the second stage began. At 4.15 A. M., after strong bearing-down pains for over three hours, the head remained high. Nevertheless, there was a fair caput succadaneum and the bones of the head overrode considerably. The patient was tired out and her pulse had risen to 120.

In the application of forceps thick meconium came away. It was soon apparent that a live child could not be delivered by forceps. A version could not be done on account of a tightly contracted uterus, so that a Cesarean section was decided upon and the conservative operation performed at 6.20 A. M.

The child, weighing eight pounds and six ounces, was delivered in forty-one seconds. The operation lasted forty-nine minutes. During the operation the third and fourth lumbar vertebræ were found to be rolled forward and very prominent. Undoubtedly this deformity prevented the descent of the head.

The patient reacted well. There was some intestinal paresis for forty-eight hours. Her convalescence was also disturbed by a dry

pleurisy, probably due to a pulmonary infarct. Her highest temperature was 100.8° F. The baby did well at first on the bottle and afterwards on breast milk, supplemented by modified milk.

This case is one where it is difficult to determine what to do. The external measurements of the pelvis were good, the promontory could not be felt. If we relied on these signs alone we would be free from anxiety as to the outcome. Yet the age of the patient, the rigidity and length of the cervix, and the high position of the head makes one intuitively scent trouble. One might ask in this case why labor was not induced earlier. Experience tells us that with similar conditions pains are not easily started. If anything of a major nature has to be done after inducing labor in such cases, one is exceedingly handicapped in obtaining a successful result. If the cervix had softened or shortened earlier, I should have immediately inserted a balloon. This case was one of the borderline cases where, with strong pains, the head, although held high by a lumbar lordosis, might have been forced through the pelvis. It is like so many cases where, after a difficult forceps or version, the child has been lost and the maternal parts have been dangerously torn or bruised. Often the shock and hemorrhage resulting from such operations leaves the patient in a much worse condition than a Cesarean section. In retrospect I would have preferred to have allowed this patient to have fallen into labor spontaneously, and thus all the chances of infection from vaginal manipulation could have been avoided.

Every day the operation of Cesarean section is becoming more and more common and the indications more and more relative. Only a little over a decade ago to deliver a woman by the abdominal route meant taking great chances for the mother's life. Consequently the operation at that time was rare and its mortality high. Nor did this method of delivery quickly find favor. It was only gradually, after the results of daring surgeons were known, that the fear of a fatal outcome vanished. To-day a Cesarean section creates no wonder. Nearly every medical journal reports successful cases. I have collected eighty-seven Cesarean sections reported during the year 1903, and one hundred and forty-eight for the year 1904. The results at large are so excellent that no careful surgeon, who is sure of his aseptic technique, who has an average amount of skill, and who has ordinary assistance, should be afraid to perform the operation on proper cases.

During the first ten years and nearly three months of the existence of the Sloane Maternity Hospital, from January 12, 1888,

to May 1, 1898, in 7,205 cases the records do not show a single woman delivered through the abdomen in the hospital. This seems very remarkable, for certainly from a modern standpoint there were numerous indications for a Cesarean section. During this period there were 80 high forceps operations performed, with fetal deaths amounting to 31, 26 at birth, or 32.5 per cent. still born, and 5 more in first ten days after birth, a mortality of 38.7 per cent. The indication for the operation was an evident deformed pelvis in twenty-five cases. In how many cases there was a relative disproportion between the head and the pelvis it was impossible to determine. In these 25 cases 15 babies were lost—13 at birth (52 per cent. still-born), and 2 later, a mortality of 60 per cent. In five of these cases forceps failed, and a craniotomy was finally necessary. Of the eighty high forceps cases six mothers died—a mortality of 3.5 per cent.; four from eclampsia, in one of which the uterus was ruptured; one died from a ruptured pus tube and another from sepsis. There was, therefore (counting the septic and the ruptured uterus case), a mortality of 2.5 per cent. for the operation itself.

During this same period eighty-seven medium forceps were performed. The number of still-born babies totaled nineteen; ten subsequently died—a mortality of 19.5 per cent. at birth and 33 1-3 per cent. altogether. Nineteen of these operations were done for an absolute deformity of the pelvis, and of this number five babies were lost—a mortality of 26.3 per cent. In one of these cases a craniotomy was necessary to complete the delivery. In the medium forceps cases, six mothers died—a mortality of 6.7 per cent.; one from gangrene of a dermoid cyst; one from sepsis; the four others from eclampsia, in one of which the uterus was ruptured. Excluding three of the deaths from eclampsia, and the septic case, which was infected before admission, there was a maternal mortality from the operation of 2.3 per cent.

During this first period there were one hundred and eighty-three podalic versions performed. The number of still-births was seventy-seven; fifteen other infants subsequently died. Twenty-one of the babies lost, however, were either monsters, macerated, non-viable, or dead before the operation was performed. Excluding these cases, there would be a fetal mortality of 34.5 per cent. The operation was done for a contracted pelvis in thirty-nine cases. Of these, twenty-three infants were still-born, or 58.9 per cent.; two others subsequently died, a mortality of 64 per cent. In eight of these cases it was necessary to perforate the aftercom-

ing head. There were sixteen maternal deaths in one hundred and eighty-three version cases—a mortality of 8.7 per cent.; seven from eclampsia, in one of which the uterus was ruptured; six from placenta previa, in two of which the uterus was ruptured; one from accidental hemorrhage; one from sepsis (a case infected outside the hospital), and one from a ruptured uterus. Here were four cases, or 2.2 per cent., where it was certain that the operation was responsible for the maternal mortality.

In this first series of seven thousand two hundred and five cases, there were fifty-six craniotomies. Twenty-five of these were done for deformed pelvis, seventeen of which after forceps or version had failed. The operation was done four times on living children, but in one of these the condition of the mother was so poor that no other operation was warranted. Nineteen of the mothers in the whole series died—a mortality of 33.9 per cent. However, nine were eclamptic and six others were moribund on admission. Six mothers died in the contracted pelvis cases. Three were moribund on admission; of the other three, one died from eclampsia, one from sepsis, and one from a ruptured uterus, for which the management was responsible. Counting these two cases last mentioned, there was a maternal mortality of 8 per cent. for the operation itself in contracted pelves.

One symphyseotomy was done during this time. The mother and child lived, but the mother had considerable difficulty in locomotion at the time of her discharge from the hospital.

From May 1, 1898 (the date when Cragin performed the first Cesarean section), to October 1, 1904, in six years and five months, there were eight thousand four hundred and six additional deliveries at the hospital, making a total of fifteen thousand six hundred and eleven cases on which these results are based. During this later period there were one hundred and forty-nine high forceps operations performed. The total number of babies born dead was fifty, or 33.5 per cent.; seventeen other babies died subsequently—a mortality of about 44.9 per cent. The indication for the operation was a deformed pelvis in seventy cases. In twenty-eight of these the children were still-born, or 40 per cent., and eleven others died before leaving the hospital—a mortality of 55.7 per cent. In ten a craniotomy was done after forceps had failed. Of the one hundred and forty-nine high forceps cases, six mothers died—a mortality of 4 per cent.; two from eclampsia; two from a ruptured uterus, one of which was moribund on admission; two from sepsis, in one of which the infection possibly originated in

the hospital. Counting the two cases where the management was responsible for the fatal outcome, there was a mortality of 1.3 per cent. for the operation itself.

During the second period there were two hundred and eleven medium forceps operations performed. The total still-births numbered eighteen, or 8.6 per cent.; eleven others of the infants subsequently died—a mortality of 13.1 per cent. In thirty-one of these cases the pelvis was contracted. Of this number, three babies were still-born, or 9.6 per cent, and two others subsequently died—a mortality of 16.1 per cent. Three mothers died—one from the toxemia of pregnancy, one from chronic endocarditis, and one from sepsis, possibly originating from faulty technique—a maternal mortality of .4 per cent. for the operation.

In the second series two hundred and eighty-one versions were performed. One hundred and fifty-seven babies were still-born; fifty-four of these children were either dead, deformed, macerated or non-viable at the time of the operation. Excluding these, there was a percentage of 45.8 per cent. still-born; twenty other infants subsequently, died raising this percentage to 54.1 per cent. Only sixty-four of these operations were done for a deformed pelvis, yet in twenty-eight of these cases the babies were born dead, in seven of which the aftercoming head had to be perforated; five babies, however, were deformed or already dead. Excluding these, there is a mortality of 39 per cent. Twenty-six mothers died—a mortality of 9.2 per cent.—fourteen from toxemia of pregnancy and eclampsia, in three of which the uterus was ruptured; nine from placenta previa, in one of which the uterus was ruptured; one from accidental hemorrhage; one from a ruptured uterus; and one from pneumonia. Counting the ruptured uteri, there was a mortality for version iself of about 1.7 per cent.

In the eight thousand three hundred and six deliveries, seventy craniotomies were performed; thirty-one of these were done for deformed pelves. In three the children were alive, but either their poor condition or the poor condition of the mothers would not warrant a cutting operation. Six mothers died—a mortality of 8.6 per cent.—all but one case had been neglected or maltreated before coming to the hospital. Counting this one case, there would be a maternal mortality of 3.2 per cent. for the operation in contracted pelves.

During this latter period four symphyseotomies were performed by two different operators. Two mothers died from sepsis—a

mortality of 50 per cent. One was discharged with incontinence of urine, due to an injury to the bladder; one left the hospital apparently in a normal condition. One baby was still-born and another died before leaving the hospital—a fetal mortality of 25 per cent. The last symphyseotomy at the Sloane Hospital was performed in March, 1901.

From the beginning of the hospital until the present date, Oct. 5, 1904, in fifteen thousand six hundred and thirty-seven delivtries, three hundred and eighty labors have been induced for various indications. One hundred and forty-eight babies were still-born—a mortality of 39 per cent. For deformed pelves, labor was induced one hundred times. Twenty-one still-births occurred—a mortality of 21 per cent. In induction of labor for deformed pelvis, three of the mothers died from sepsis—a mortality of 3 per cent. from the operation.

From May 1, 1898, to the present date, thirty-eight Cesarean sections have been performed at the Sloane Hospital, thirty by Dr. E. B. Cragin, one by the late Dr. E. A. Tucker, and seven by the writer. Three patients died—a mortality of 7.8 per cent.; one from a cerebral embolus; one from a pyemia; the third was moribund on admission from an obstructed labor due to a carcinoma of the cervix and adjacent structures. All the babies were born alive except in the carcinoma case. This fetus was already macerated when removed through the abdomen. Two children subsequently died on the eleventh and fourteenth day respectively from malnutrition. This would give no fetal mortality from the operation itself. Counting the two babies which died before leaving the hospital, the fetal mortality would be 5.4 per cent.

All maternity hospital results are unsatisfactory, for the reason that so many cases are admitted in labor, having been neglected or maltreated by doctors and midwives outside. Yet, allowing for such adverse conditions, these statistics show that prior to 1898, and even since that year, many infants were sacrificed, which with Cesarean section undoubtedly could have been saved.

We have found that before and after 1898 a high forceps carried with it a percentage of still-births of 32.5 per cent. and 33.5 per cent. respectively in all cases in which this operation was performed; whereas when the indication was a deformed pelvis it ran up to 52 per cent. and 40 per cent. respectively.

Even in a medium forceps for the first period, 19.5 per cent., and for the second period, 8.6 per cent., of the babies were still-

born; while in indexed deformed pelves, the fetal mortality for this operation was 26.3 per cent. and 9.6 per cent. respectively.

What can be said of version? In the first period when this operation was performed for various indications 34.5 per cent. of the infants were lost at birth; for contracted pelves, 58.9 per cent. of the babies were born dead. In the second period in all cases the fetal mortality for version was 45.8 per cent.; in contracted pelves it totals 39 per cent.

In the craniotomies, of course, all the babies succumbed, and in symphyseotomy a percentage of one out of every five died. In induction of labor for all indications, 39 per cent. of the children were still-born; for contracted pelves the fetal mortality totaled 21 per cent.

These results are startling. For when obstetric operations carry with them a tremendous fetal mortality (21 per cent. to nearly 59 per cent.), it should make the accoucheur hesitate about attempting them. However, if each individual case here reported were carefully analyzed, the fetal mortality would probably be much lower, for many of the babies succumbed to *other causes* (prematurity, etc.) than the operation, or were sacrificed to save the mother.

In contracted pelves cases, the same is true to a less extent, for some of the babies were lost from other causes than those connected with the pelvic deformity. Yet excluding these few cases, the fetal mortality for the operations performed for dystocia due to contracted pelves is too high. The lowest fetal mortality for any one of them is that for medium forceps, 16 per cent.; for the others, induction of labor, 21 per cent.; for high forceps, 43.2 per cent.; for version, 49.5 per cent.; for symphyseotomy, 20 per cent., and for craniotomy, 100 per cent.* If to this number we added not only those babies who sooner or later die from injuries received at birth in performing these operations, but also those idiots, epileptics, paralytics, et cetera, whose cerebral and other lesions can be traced to the methods employed for their advent into the world, our mortality would be still higher. These results are very discouraging, and when we remember that operative deliveries are more and more frequently necessary to-day than eight or ten years ago (just about doubled per one hundred cases in the second period), much material for deep thought is at once brought forward.

How different is the result in a Cesarean section—the life-saving operation for the child—practically all the babies saved, perfect

*Percentages based on both periods (15,611 cases).

in every way, and unharmed? Every one will say this is very true, but are we justified in recommending such an operation to save the life of a child, thereby increasing the risk of the mother? To this an affirmative answer can be given for certain cases if we can prove at the present day this risk is slight or not so much greater to her than when the other operations are performed.

I have placed all the figures to be enumerated subsequently at a minimum, and, omittting all doubtful cases, find that at the Sloane Maternity Hospital in 15.611 cases there is a maternal mortality of 3 per cent. for induction of labor, 1 8-10 per cent. for high forceps, 2 1-10 per cent. for version, 2 4-10 per cent. for craniotomy; whereas, for symphyseotomy, 40 per cent. of the mothers died. These percentages are based on all cases, easy and difficult, where the operation itself, as far as I could judge, was responsible for the mother's death.* If I could simply take the difficult forceps operations, the difficult version cases, the difficult craniotomies—the cases where in the beginning a Cesarean section would enter into competition with these operations—the maternal mortality would be much higher. I personally believe that much more risk is taken for the life of the mother in performing one of the other major operations when it is difficult from the shock, hemorrhage and sepsis resulting and more damage is done by the unavoidable tears, contusion and sloughing of the maternal soft parts than when the cutting operation itself is performed.

At the Sloane Hospital, excluding the carcinoma of the cervix case, which was moribund on admission, the maternal mortality for Cesarean section is 5.4 per cent. One might say this is a fairly high figure, especially if those cases delivered by the abdominal route were selected. The cases were not all selected. Many of the patients were admitted in labor. Many had been repeatedly examined, in many labor had been induced with the hope that delivery could be effected through the pelvis, and in some of the cases forceps had been used tentatively.

Many other operators report much better results. Reynolds reports twenty-three Cesarean sections without a death; Charles, ten; Gummert, eight; Williams (performed in Johns Hopkins Hospital) eleven; Jardin, ten; and Fournier, five, without a death. Zweifel only lost one case in seventy-six operations. Cragin lost one mother in twenty-nine operations (excluding a moribund case).

*The operation is held responsible for deaths from sepsis occurring in cases unexamined before coming to the hospital.

Here are 172 operations performed by eight different surgeons giving a mortality of 1.2 per cent.

In a series of 508 cases operated upon by Leopold, Reynolds, Pasquali, Olshausen, Charles, Zweifel, Bar, Chroback, Schauta, G. Braun, Gummert, Boissard, Fournier, Hahn, Cragin, Williams, Sinclair, Ill., De Lee, Coles, Davis, Carmalt, Moran, Jardin, Lewis, Chapman, Hillier and the writer, the maternal mortality comes to 6.49 per cent. Deducting the moribund cases and those infected before the operation, as suggested by Williams, there would probably be a corrected mortality of between 3 and 4 per cent. Besides, many of these operations were done years ago (before 1900) before the modern indications and the modern technique of the operations were determined.

	Cases.	Deaths.
Leopold	76	7
Reynolds	23	0
Pasquali	9	1
Olshausen	29	2
Charles	10	0
Zweifel	76	1
Bar	14	1
Chroback	10	1
Schauta	58	6
G. Braun	34	4
Gummert	8	0
Boissard	3	0
Fournier	5	0
Hahn	47	3
Cragin	30	2
Williams (Johns Hopkins Hospital)	11	0
Ill	10	1
De Lee	3	1
Coles	3	0
Sinclair	10	0
Davis	6	1
Carmalt	3	0
Moran	2	0
Jardin	10	0
Lewis	2	0
Chapman	2	0
Hellier	7	1
Voorhees	7	1
	508	33

Mortality 6.49 per cent.

All of these statistics show that in view of the low maternal mortality of Cesarean section, we are justified in recommend-

ing its performance in the interests of the child in proper cases—*i. e.*, where the women are uninfected, where we have favorable surroundings and moderate assistance, and provided the operator has a good surgical training.

The operation itself is a simple one, but at the same time a dangerous one. There will always be some mortality for Cesarean section, as accidents will occur after any operation requiring an anesthetic.

DANGERS.

(1) What is feared most of all is infection. One might say that with minute and rigorous asepsis this complication ought to be avoided. This is very true, and to operate aseptically is so important that the conservative operation is contraindicated when the vagina and cervix are affected. Leopold and Haacke consider even a gonococcus infection of the vagina a contraindication to a Cesarean section. But these facts are often indeterminable in an emergency, and we must operate now and then taking the risk of sepsis. In the borderline cases the possibility of infection always confronts us. I mean in cases where labor has been induced with the hope of a normal process, or at most an easy forceps or version delivery, but where nature or these measures fail us. In these cases the membranes may have been long ruptured; there may have been many vaginal examinations and much vaginal manipulation. In just such cases some slight error in technique will be responsible for the morbidity or the possible mortality from sepsis which may follow. Almost all the operators who have the lowest mortality for Cesarean section will not take such chances. Reynolds and Bar prefer to operate before or at the very beginning of labor. Williams and others advocate in cases where one is not absolutely sure of his asepsis that if a Cesarean section is decided upon a modified Porro operation ought to be performed. I believe, however, that in some of these borderline cases, such as at least two of those in my own series, we must take this chance of infection, for the patient must be given the test of labor. Peritonitis, pyemia, abscesses of the uterine wall, stitch abscesses of the abdominal wall, and phlegmasia alba dolens following Cesarean section have been reported, but such complications will be more and more rare with our modern aseptic technique. Spreading the omentum over the uterine incision when infection is possible will tend to localize the process at this site and prevent an involvement of the general peritoneum.

(2) A second danger is hemorrhage. This should be feared the most when the operation is done where labor has started. Leopold has been compelled to remove the uterus for hemorrhage from complete uterine atony during a Cesarean section. When the operation is done during labor this danger is less often encountered. The hemorrhage during the operation seems profuse, especially if the placenta is under the uterine incision, but it is easily controlled by tamponing the uterine cavity, by a quick uterine suture, by pouring hot salt solution on the uterus, and by rubbing up the fundus. A hypodermatic injection of ergotol is also of service. Elastic ligatures about the lower uterine segment and compression of the vessels in the broad ligaments are usually unnecessary. The hemorrhage from a tear extending from the lower end of the uterine incision toward the cervix may be very troublesome and require a hysterectomy. This accident is liable to occur where it is difficult to deliver the child. The uterus occasionally hugs it so tightly after an early rupture of the membranes or the head is sometimes so wedged into the pelvic brim that considerable force is necessary to extract it from the uterus, and a tear results. A longer incision and carrying the incision higher toward the fundus will prevent this complication. Also it is preferable to bring the child through the uterine wound feet or head first. If it is delivered by the arm, we have practically a shoulder presentation and a larger mass to come through the incision. In this manner of delivery there is greater danger of extensive tearing of the uterine wall.

(3) The conservative operation carries with it little shock, if it is done quickly and before the woman is exhausted by a protracted labor. This complication is far less after a Cesarean section than after a prolonged forceps operation or after a difficult craniotomy. I must confess that I have been much more anxious about my patients immediately after these two obstetric operations than after my Cesarean operations. When a hysterectomy, however, is performed after removing the child, the shock is often considerable. Consequently this extra risk is occasionally an additional contraindication against the removal of the uterus.

(4) Another immediate danger of the conservative operation is the detachment of a thrombus from the venous sinuses in or near the uterine wound. Such an embolus occluding the pulmonary artery or some vessel of the brain, may cause sudden death. This accident prevented a perfect record in Cragin's series.

Are the remote sequelæ to a conservative Cesarean section of consequence?

(1) Is sterility possible?

Torggler, Lochlein, Wallace, Haven and Young have proven that there is no real ground for diminished fertility after a Cesarean section. Lauvray has collected one hundred and thirty cases of repeated pregnancies after this operation. In this series one hundred and three patients were operated upon twice; twenty were operated upon three times; four, four times; two, five times. One woman died after the seventh section. Wallace has collected ninety-six cases and Haven and Young eighty-eight cases of repeated Cesarean operation. In Leopold's series thirteen women became pregnant again, went to term, and were operated upon again by him. These statistics show that the performance of the conservative operation does not interfere with future conception. If a patient is apt to become pregnant again, the question is asked, "Why is she left with the possibility of another laparotomy?" In answer we will say that (*a*) in the borderline cases it is possible to have a normal process the next time by inducing the labor; (*b*) in cases of extreme deformity it is also better to leave the organs intact. Such a woman is less nervous, healthier and happier in her marital relations. If it is subsequently necessary for her to have another Cesarean section, there is no increase in the risk of the operation. In Wallace's series of ninety-six repeated Cesarean sections the maternal mortality was 6.45 per cent. Bar, Zweifel, Leopold, and Olshausen have performed twenty-six repeated sections without a death. These statistics may indicate that the second operation is less serious than the first. I believe a hysterectomy should be performed only in cases which have been a long time in the second stage of labor and are infected, where the hemorrhage is uncontrollable from uterine rupture or atony, where the uterus is the seat of carcinoma or large fibromyomata, and possibly for osteomalacia. The other methods of sterilizing the woman are unsatisfactory and I do not believe in employing them.

(2) A hernia in the abdominal scar is another sequel to a Cesarean section. Abel cites ten cases and Bar another after the woman's third operation. Rarely does this complication require surgical aid, although Coe performed two operations for the relief of a hernia in one of his cases. With a short abdominal incision (the scar in one of my cases measured only eight and seventy-five hundredth cm. (3½ in.) seven months after the operation),

with a three-tier suture of the abdominal wall, and with no infection, a hernia in the abdominal scar should be very rare.

(3) How often do adhesions result between the uterus and intestines or the abdominal wall after a Cesarean section? Wallace in ninety-six repeated operations claims that adhesions form in as high as 75 per cent. of the cases. These adhesions should be insignificant without infection. Routh, Everke, Sinclair, Pillore, and Wallace advocate complete uteroparietal union, so that a subsequent Cesarean could be done extraperitoneal. Light adhesions simply suspend the uterus and possibly cause local pain, uterine cramps, and subinvolution—all of which were noticed in a few of the Sloane cases. Extensive adhesions may render the second operation more difficult. More time may be consumed if it is necessary to separate them, the intestines may be injured, and there is liable to be more shock and hemorrhage from the operation. Complete asepsis and the modern operation certainly have made these adhesions very infrequent.

(4) Uteroabdominal fistulæ resulted from infection in two cases of the Sloane series. The channels closed up, however, after a few weeks. Whether any trouble has been experienced by the patients since they left the hospital is unknown. Cases have been reported where the sinus has persisted. Schenck reports one in which during menstruation the bloody discharge flowed out of the abdominal opening. Lauvray has collected four cases where during a subsequent labor, liquid amnii leaked through the fistulous tract. I believe this complication is only apt to occur when the operation is done late in the second stage of a protracted labor. In these cases the lower uterine zone is tremendously thinned out and compressed by the head. A necrosis of the uterine wall results, which, with infection and parietal adhesions, may cause a canal both through it and the abdominal wall.

(5) After a Cesarean section is a rupture of the uterus possible during a subsequent pregnancy? Krukenberg has collected seven cases of rupture of the uterus in the old scar; five cases where the scar was thinned out without rupture; and three cases of rupture in close proximity to the scar. Woyer reports a case of rupture of the uterus from hydramnios. Harris has collected three other cases. In Leopold's thirteen cases and in Olshausen's four cases of repeated Cesarean section there was no tendency to rupture of the uterus. Schneider was unable to find the old uterine incision in a case. Other operators report a little white line. It is claimed that when the uterus enlarges during a second pregnancy the scar

does not hypertrophy, but the muscular fibers do. If the uterus is firmly sutured, and if there is no infection, the uterine wall is solid and there is little or no danger of rupture during a subsequent pregnancy or labor. In most of the cases in which this accident occurred the patients were operated upon by old methods or infection took place in the uterine suture. In a repeated Cesarean it is possibly better to incise at another site, though not absolutely necessary.

(6) After a Cesarean section is an extrauterine pregnancy more liable to occur?

Not necessarily, although Tarnier and Budin report a case.

(7) Another complication to a conservative operation is the retention of the lochia followed by chills and a high temperature—*i. e.* sapramia. This happened in three or four of the Sloane series. In such cases the cervix was only partially dilated at the time of the operation or closed too quickly afterward. A preliminary manual dilatation and a wide strip of gauze through the canal will ordinarily obviate this difficulty.

Finally one can see that the question of most of the immediate and all of the remote dangers and complications which may follow a Cesarean section depend on one cause—sepsis. That is to say, when our aseptic and antiseptic technique are perfect our results should be practically perfect.

There is no question that a Cesarean section is the only means of delivering a live child in marked degrees of pelvic deformity, and where tumors of various kinds block the parturient canal. The disputed points arise where the pelvis is only moderately contracted. Williams estimates the frequency of deformed pelves in Baltimore to be 13 1-10 per cent. Davis's percentage for Philadelphia is 25 per cent. In foreign cities the percentage of deformed pelves varies from 2.8 per cent. to 22 per cent. In the last ten thousand cases at Sloane Maternity Hospital there were nine hundred and seventy-two contracted pelves, or 9 7-10 per cent. for New York.

The varieties were as follows:

Justo-minor	518
Flat	288
Flat justo-minor	79
Rachitic	28
Obliquely contracted	30
True Naegele	3
Kyphotic	12

Masculine	10
Kyphoscoliotic	3
Osteomata blocking the canal	2
Funnel	1
Transversely contracted	1
	972

In six hundred and forty-five of these cases labor terminated spontaneously—66 3-10 per cent. These figures are approximately the same as Williams's percentage of 71 59-100 for two thousand one hundred and twenty-three cases, and as other compilers report.

The operative deliveries were as follows:

Labor was induced	49
High forceps performed	52
Medium forceps performed	32
Low forceps performed	78
Breech extraction performed	14
Versions performed	54
Craniotomy performed	29
Symphyseotomy performed	4
Cesarean sections performed	29
	341

In fourteen of the induced labors, major operations were subsequently necessary.

Omitting breech extractions, low and medium forceps deliveries, we have in our series one hundred and eighty-four operations performed which might enter into competition with Cesarean section.

I am unwilling to discard, as Bar, Pinard, and Williams have, an induction of labor in the management of all contracted pelves. The fetal mortality at the Sloane Hospital for this operation is fairly high—21 per cent. of the babies were still-born and only 71 per cent. were discharged from the hospital in good condition at the end of two weeks—but we must remember that a large number of the cases on which this percentage is based were delivered before the era of the cutting operation, even as long ago as 1888. Williams makes the statement that, after an early induction of labor for contracted pelvis, 50 per cent. of the infants are lost at birth or within the first month of life.* I think these figures are

*Discussion, Trans. Am. Gyn. Assn., xxvi, 1901.

rather high. Hahl reports that in eighty-four cases of induction of labor for contracted pelves, 75 per cent. of the babies were born alive; 59.5 per cent. were discharged in good condition; and at the end of the year 50 per cent. of the children had survived. Lorey, in one hundred cases of induced labor for contracted pelves, reports that 76 per cent. of the babies were born alive; 60 per cent. were discharged in good condition from the Frauenklinik at Halle, while 40 per cent. were living at the end of the first year. Norris, on the other hand, reports 76.6 per cent. of the babies alive after two to ten years in thirty cases of induced labor for contracted pelves without maternal morbidity or mortality.

In one hundred and twenty-three thousand five hundred and seventy-six deaths occurring in New York City from 1898 to 1900, twenty-nine thousand three hundred and twenty-six, or twenty-four per cent. were children under one year of age. How many children who were born at term die in the first year would be difficult to estimate, but we all know that undoubtedly the number is very large. Again, babies born prematurely by induction of labor at a hospital receive poor care, and generally little or no medical attention after their discharge, and, therefore, the mortality is necessarily high. In private practice, our results ought to be far better. With these facts and figures, and from my own personal experience, I still believe that labor can be induced with good results in slight to moderate degrees of contracted pelvis, *i. e.*, where any one of the pelvic diameters is not less than 8 cm. The child, however, should have reached thirty-six, preferably thirty-eight, weeks of intrauterine gestation, the head should not be too large, and the cervix should not be long, closed, and tough. With these conditions favorable, I believe a very large percentage of the babies ought to survive. To determine just when to interfere and to estimate the exact relation of the size of the child's head to the pelvic canal are both very difficult questions. I will admit mistakes are often made. Pregnancy has been allowed to go too long, and the child has been lost frequently after a difficult labor. Two other indeterminable factors may be responsible for failure, and are possibly the most important of all. (1) Will the uterine contractions be strong enough? (2) Will a long and immature cervix soften up and dilate? All our experience will not help us out on these points.

Williams' plan of letting all cases "go to term, fall into labor, complete the first and enter the second stage to ascertain what nature can do," especially if gestation is prolonged, will cause

more Cesarean sections and other major operations than are necessary. This procedure of his is based upon the number of spontaneous deliveries in contracted pelves. He may save more babies, but at the same time the risk for the mother is much increased. Many Cesarean sections will be done, where if one had interfered and induced labor the result would be just the same for the child. Nor do I agree with Reynolds, who performs Cesarean section early in labor, without giving Nature an opportunity to deliver the woman. I believe that in well-selected borderline cases, where the pelvic contraction is slight, or moderate, labor can be induced without injury to the interests of the child, most of them being born spontaneously.

By the statistics of this paper, I do contend that too many difficult high forceps and versions are performed. I agree with Hellier and Williams, that the absolute indication for a Cesarean section should be a pelvic diameter of 7 cm. or less. I also agree that the relative indication should be broadened, but I would go even farther than they do, and have no exact limit to the size of the pelvis, because this limit can only be reached when the forceps has been applied to an unengaged head or one which is dipping into the brim, and moderate tractions are used without any advance, and where a contracted uterus contraindicates version. If a version is performed, very few children at term survive after coming through an internal conjugate of 8 cm. Even a true conjugate of 8.75 cm. to an average child is a close fit. Not that a child cannot be saved by version when forceps has failed, for I have often had this good fortune myself. I do believe, however, that if a version is done where the child is of a fair size and the pelvis is moderately contracted (an internal conjugate of 8.50 cm. or under), especially in a justo-minor pelvis, most of the babies will be lost. I also condemn a prolonged high forceps operation, pulling for one-half, three-quarters, an hour, or even longer, without any advance of the head, using all one's available strength. We know perfectly well that the child in most of such cases will sooner or later die, and that the mother, if not killed, may be irreparably injured. In choosing a high forceps or a version operation, the measures most often selected for slight or moderate degrees of pelvic deformity, the best judgment in estimating the relative size of the head and pelvis is required, the greatest skill in the technique of the operations must be employed, and vast experience is necessary for a successful outcome. The test practised by Reynolds of manually dilating the cervix *early in labor*

and using the forceps tentatively before doing a Cesarean section is insufficient. I have seen too many cases where doctors outside have applied forceps too soon and failed to deliver, terminate an hour or two later at the hospital spontaneously or by an easy forceps. When labor has started in either spontaneously or by an induction, I certainly believe in giving Nature a chance, and performing an elective Cesarean section only when one is sure that the birth of a living child through the pelvis is reasonably impossible.

With the low maternal mortality of a Cesarean section, a craniotomy, except on rare occasions, should never be an operation of choice if the child is alive. When, however, the woman is in unfavorable surroundings and is already in such a poor condition after a protracted labor and bad management that infection is certain, a craniotomy should be selected, even though the child is living and in good condition. Again, if the child shows signs of dissolution by a rapid and weak fetal heart, if the head has sustained injuries from prolonged tractions by the forceps, and if the indications are greatly against its being born alive and healthy, a craniotomy should be done. At the same time, we must remember that a difficult craniotomy is often more dangerous for the mother than a Cesarean section. We should never attempt a craniotomy where the pelvic contraction is such that the dragging of a crushed head will cause excessive shock and hemorrhage from the contusion and laceration of the maternal soft parts. Nor should we perform a craniotomy in cases where sepsis and necrosis are bound to occur from extensive sloughing of the tissues. In such cases, a laparotomy should be done, and the uterus should be removed. Of course, in an emergency, and with unfavorable surroundings, a craniotomy of necessity will be performed now and then on a live child, but more rarely with the more universal knowledge of the art of obstetrics. Hellier, however, makes the statement that this operation is only justifiable "in a mountain hamlet by an isolated country practitioner."

When shall symphyseotomy be performed? This operation is surely on the decline. Zweifel, Jewett and Frey still advocate its employment in a limited number of cases. Even Bar, who has performed twenty-three symphyseotomies without a death, says that the operation is not so easy that it can be done by a physician who has only a preliminary obstetric training. Hellier has discarded symphyseotomy altogether? Williams says that he does not expect to perform it under any circumstances. Gigli main-

tains that the operation is an incorrect one from a surgical standpoint. Cragin did his last symphyseotomy in March, 1901.

In two hundred and twenty-one symphyseotomies performed by Rubinrot, Abelly, Pinard, Zweifel, Kustner, Bar, Lepage, and Boissard, the maternal mortality came to fourteen and four-tenths per cent.

	Cases.	Deaths. Mother.	Deaths. Child.
Rubinrot	136	15	19
Abelly	8	3	2
Pinard	100	12	13
Zweifel	31	0	2
Kustner	7	0	0
Bar	23	0	0
Lepage	7	1	2
Boissard	9	1	3
	221	32	41

In this same series, eighteen and five-tenths per cent. of the babies succumbed. In Bar's cases, the morbidity was as high as eighty-one and eighty-one one hundredths per cent. When any operation performed in the interest of the child carries with it such a high fetal and maternal mortality, where the convalescence from any operation is so prolonged and so interrupted by annoying and dangerous complications, and when a patient can be threatened with the misery of chronic invalidism, I believe that then we have no right in recommending a symphyseotomy in place of another operation, such as a Cesarean section, which is less dangerous and presents far better results.

The only possible indication for a symphyseotomy in the hands of a good surgeon would be in cases where the head is impacted well down in the pelvis after a prolonged labor, where the child is alive, and where forceps is unavailing. Whether Gigli's operation will supplant symphyseotomy and fulfill the earlier dreams of symphyseotomists is yet to be determined.

Conclusions:

(1) That Cesarean section is a dangerous operation only when infection is present.

(2) That there are too many fetal deaths from the other major operations.

(3) That in view of the low maternal mortality, the field for Cesarean section should be broadened.

(4) That in contracted pelves of a moderate degree (in the borderline cases), a late induction of labor is justifiable.

(5) That, when possible, difficult versions, prolonged high forceps operations, and high forceps operations performed early in labor, should be avoided.

(6) That craniotomy on a living baby is an operation only of necessity and emergency.

(7) That symphyseotomy is an operation of the past.

Finally, I wish to thank Dr. E. B. Cragin for permission to report the statistics of the cases occurring in his service at the Sloane Maternity Hospital.

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THE TWISTED PEDICLE IN OVARIAN AND PAR-OVARIAN CYSTS, WITH A REPORT OF SEVEN CASES.

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Twists of the pedicle in connection with cystic pelvic tumors are more frequent in occurrence than is commonly supposed. Every abdominal surgeon has met instances of this condition. In the course of five months recently the writer met with no less than five cases.

Ordinarily cysts of moderate size are subject to this complication, although even very large cysts are not exempt. Young girls and women at all ages may suffer from this complication.

The occasion of such a twist is not easily determinable. A sudden jolt, manipulation of the tumor in the course of examination, peristaltic movements of the intestine, sudden turns of the body (perhaps unconsciously during sleep), pressure induced by a

pregnant uterus, or uterine contractions in the course of abortion or labor, may account, in different cases, for the torsion of the pedicle. The longer the pedicle the more prone is the patient to suffer from this accident; but even short pedicles, as in parovarian cysts, do not guarantee against its occurrence.

The degree of torsion induced by the revolution of the tumor on its base varies between a segment of a circle and a full circle or more. In my own cases the smallest twist consisted of a half circle, or 180°; the most severe example exhibited 3½ turns. When the pedicle has undergone a number of revolutions it resembles the umbilical cord in thickness and gross appearance. It leads from the tumor usually downwards to the broad ligament. The color may vary between the natural light blue or pink and a more or less dark hue, according to the extent of the circulatory disturbances. Sometimes gangrene and beginning spontaneous amputation of the pedicle can be recognized. It is known, in fact, that tumors without basal connections are occasionally met with free in the peritoneal cavity, and it is assumed that, by a process of self-amputation of the pedicle, they have escaped from their original connections. Even rupture of an ovarian cyst has been attributed to a twisted pedicle.

The pedicle will vary in its structure according to the kind of cyst to which it is attached. In the case of an ovarian cyst it will consist of the ovarian ligament and a portion of the broad ligament. In parovarian cysts the pedicle will include in its structure the uterine end of the Fallopian tube, the round ligament, besides an oblique section of the broad ligament running between the uterine horn and that portion of the broad ligament lying below and including the infundibulo-pelvic ligament. In the latter set of cases the elongated, broadened, flattened Fallopian tube, with intervening portions apparently missing, will usually be discovered traversing the upper portion of the cyst wall. In some cases only vestiges of the fimbriated end will be recognized.

The appearance of the tumor itself will vary according to the disturbance induced by the torsion; nor is this necessarily dependent on the degree or the number of turns. The cyst wall may present a white and glistening aspect, or show a mottled red and black discoloration. This is readily accounted for by the various stages of disturbance in the circulation of the tumor. Digressions due to this cause may range between the normal state and advanced stages of mortification. The same is true of the pedicle.

The contents of the tumor may be the usual clear, watery liquid

characteristic of cysts (unless dermoid or blood); or, if the circulation in the pedicle has been markedly interrupted, there may be an intracystic effusion of blood, so that in some cases the liquid assumes a thick gelatinous consistency.

Various associated conditions may complicate the pathological picture of cysts with twisted pedicles. Peritonitis—with or without intraperitoneal effusion—is usually present in bad cases. Evidences of peritoneal irritation may be met with in incipient cases, or in those in which the twist has been spontaneously unraveled. Secondary appendicitis, with adhesion of the appendix to the cyst wall, occurred in two of my cases. Adhesions to the omentum or intestine may be met with. Such adhesions sometimes result in diminishing the intestinal lumen to the extent of markedly obstructing the progress of feces, and clinically present the picture of acute intestinal obstruction. Renal colic and cholelithiasis are rare complicating conditions which may tend to obscure the coexistence of a cyst with a twisted pedicle.

There may be no symptoms at first resulting from torsion of the pedicle, or the symptoms may be so alarming that the life of the patient is despaired of. In one of my cases a pedicle showing 3½ turns gave rise to no symptoms at all, and was only recognized after the abdomen had been opened for the removal of a fairly large cyst accidentally discovered during an examination under anesthesia.

In the majority of cases, however, the history will point to a sudden agonizing abdominal pain referred to the site of the twisted pedicle. Later the pain may be referred to the opposite side, where tumors with long pedicles are apt to drop. In a number of my cases tumors have been discovered in the side of the abdomen or pelvis opposite to that from which they grew.

Fever is either absent or runs a low grade. Seldom will the temperature range above 102° or 103° F. Ordinarily it will be found between 100° and 101° F. The pulse does not necessarily correspond to the fever, but is rather in sympathy with the degree of peritoneal irritation. In the case of the tumor with twisted pedicle discovered unexpectedly and producing no symptoms, the pulse rate did not exceed 90 per minute. In other cases I have counted the pulse as high as 120, 140, or even 160 per minute. I believe that the nervous temperament may be partly responsible for the higher pulse rates. These patients ordinarily present an anxious countenance if they are suffering great pain. In some of

the cases tympanitis and exquisite abdominal sensitiveness may justify the diagnosis of acute general peritonitis.

Two of my cases presented all of the signs and symptoms of acute intestinal obstruction. In both of them vomiting was the most striking symptom, although in neither did it acquire a fecal character. The bowels could not be moved in either case for three or four days, in spite of cathartics and enemata. Even flatus was not passed. Only after being transferred to the hospital and with the aid of powerfully medicated enemata injected high into the rectum was it possible to overcome the obstruction, and thereby allay some of the most urgent symptoms. I cannot help but feel that the free use of narcotics must have been at least partly responsible for some of this obstipation in these two cases.

Some of these cases simulate an attack of appendicitis. One of the gynecologists of a large hospital in this city, at a meeting of a medical society, recently complained that most of these cases occurring in girls frequently fell into the hands of the general surgeons as cases of appendicitis. The clinical picture of right-sided cysts with twisted pedicles certainly does closely resemble that of appendicitis. Of course, a careful examination by a trained gynecologist would easily differentiate the conditions in the majority of cases. Cholelithiasis, nephrolithiasis, peritonitis, intestinal obstruction, and other possible complicating or assocated diseases will involve superadded symptoms, and the recognition of a cyst with a twisted pedicle may be hopelessly beyond our powers of diagnosis.

Ordinarily in uncomplicated cases, in which the presence of a cyst has been recognized, torsion of the pedicle may be suspected when the patient suffers from a sudden attack of otherwise unaccountable abdominal pain. The pain is apt to be sudden and agonizing in character. One of my cases refused operation for a long time, although multilocular ovarian cysts were known to be present. Suddenly one night she was taken with violent cramps, which led me to diagnosticate the sudden torsion of one of the tumors. The operation proved the correctness of the diagnosis. In cases in which the torsion takes place slowly the pain may be mild or perhaps entirely absent. Symptoms of intraperitoneal pressure or irritation will usually make their appearance. With the supervention of peritonitis the pain may become general, although localized at first at the site of the pedicle. Tympanites of greater or lesser degree may add to the difficulties of palpation

and differentiation. Still cases occur in which there is localized peritonitis. In these the tumor may be easily felt or even seen.

Hence the presence of a soft or tense fluctuating tumor in the abdomen, accompanied by a sudden supervention of violent pain, with more or less shock and temperature, should lead us to suspect torsion of the pedicle, with or without peritonitis. The tumor itself may be discovered anywhere in the abdominal or pelvic cavities. It may lie at times in the median line directly over the uterine fundus and closely simulate an enlarged or pregnant uterus. In the latter case the differentiation may only be possible by locating the uterus behind or beneath the tumor. It is hardly necessary to say that the sound should not be used in these cases, unless pregnancy has been absolutely excluded. By bimanual examination, if the cyst is not adherent to the uterus because of recent peritonitis, one may often recognize the mobility of the uterus as distinct from that of the tumor. This latter mode of differentiation will, of course, be more applicable to cysts situated to either side in the pelvis or abdominal cavity. The side from which the pedicle springs cannot always be determined with accuracy, because such tumors, having long pedicles, often drop over to the opposite side.

The prognosis of torsion of the pedicle in pelvic cysts will depend on the recognition of the accident and the treatment. Fortunately nearly all conditions producing local or general peritonitis are nowadays recognized as belonging to the domain of abdominal surgery. So that the indication for operative relief is apt to be recognized, and the proper course to pursue will not be long delayed.

The question arises, "Is anything lost by waiting in these cases of twisted pedicle?" The temptation certainly is strong to hurry on to operation as quickly as possible, and, theoretically, I believe this to be the proper course. Practically, I have found it wise to relieve the shock and urgent pain with small doses of morphine given hypodermatically, and to combat the threatening peritonitis by the use of local refrigeration. As a matter of fact, and chiefly because the true state of affairs was not recognized, I have operated on short notice only in one case. Even in that case, although I recognized the condition fully, it took several days before the patient would consent to the operation. In the other six cases one or more weeks must have elapsed between the time of torsion of the pedicle and the operation. As all of my small list of cases recovered, I cannot help but feel that a certain period of delay is

not necessarily prejudicial. It has occurred to me that the rest and quiet of several days, or longer, seemed to quiet the high degree of nervous tension and shock induced by the accident. In two of my cases, complicated by symptoms of intestinal obstruction, in whom the pulse ranged between 120 and 160 per minute, by overcoming the obstipation the pulse rapidly dropped down to about 100. These patients were, therefore, in much better condition for the subsequent operation than if we had proceeded at once to laparotomize. In one case operation was delayed until after the patient had convalesced from an artificial abortion done to remove a macerated fetus from the uterine cavity.

The technique of the operation is simple. After exposing the cyst through the usual abdominal incision, adhesions are carefully separated, if present, and the tumor is drawn out of the peritoneal cavity and placed on the towels covering the abdominal surface. If the pedicle is short it is surrounded with pads, so as to protect the intestines and pelvic organs from unnecessary exposure. I rarely resort to tapping of cysts. The pedicle is now caught between several clamps placed horizontally just below the seat of torsion, and the tumor is cut away on a line with the clamps. Any large vessels seen in the stump are picked up with hemostatic forceps and ligated individually. The two layers of the broad ligament at the cut surface are next brought together with a continuous suture. By this method no raw surfaces are left in the abdominal cavity. I use practically catgut alone since many years in my abdominal work. The opposite tube and ovary are next brought up for inspection and disposed of according to the indications. The appendix should be examined, in the case of right-sided tumors especially, as it may be secondarily involved and may require removal. In one case of ovarian cyst with torsion of the pedicle, which I had the privilege of examining, the surgeon discovered stones in the gall-bladder. The incision was continued in an upward direction and cholecystectomy done, so that this patient recovered with a scar extending from the sternum to the symphysis pubes. Personally, in a similar case, I should rather prefer to make a second independent incision over the region of the gall-bladder. These abdominal wounds should be closed in three layers independently—peritoneum, fascia, and muscle, and skin. Drainage is unnecessary in these cases unless pus is present.

In conclusion, I beg to submit the condensed histories of seven cases of ovarian and parovarian cysts complicated by torsion of the pedicle.

Case I.—Mrs. F. T., entered Beth Israel Hospital on May 22, 1898. She was 33 years old, had been married twelve years, and had given birth to two children. Her menses had appeared at the age of 16 and had always been regular. She had never aborted. Recently the monthly periods had been irregular, recurring once in two or three weeks. For several days previous to admission she had suffered from chills, fever, and acute abdominal pain. For several years she had complained more or less of pain in the left iliac region and back.

On admission she was found to be suffering from shock and anemia. She seemed to be suffering from severe abdominal pain and her temperature ranged between 101° and 103° F. Her physicians had variously diagnosticated her disease as pelvic peritonitis, salpingo-oophoritis, and fibroid uterus. Examination at the hospital revealed a uterus pushed to the right side by a large mass in the left pelvis, which felt irregularly soft and hard. A diagnosis of pelvic abscess complicating fibroid uterus was finally made and operation decided on.

On May 26 a posterior vaginal section was made into the soft, fluctuating portion of the tumor, but instead of pus, dark, coagulated blood made its appearance. The patient was now placed in the horizontal position at full length and a median abdominal section made. A tumor the size of a child's head was soon recognized to be an ovarian cyst with a twisted pedicle. After tying off the pedicle the tumor was cut away and the abdominal wound closed without drainage. The cyst was found to contain a gelatinous mass resembling coagulated blood. The vaginal wound was drained with gauze. The patient developed a severe ether bronchitis, which sent her post-operative temperature up to 103° F., and her respirations to 40 per minute. She made a slow recovery and left her bed on the twentieth day.

Case II.—Mrs. T. R., æt. 40, married seventeen years, but never pregnant. She consulted me on September 4, 1901. Her menses began at 14 and always caused her great suffering, so that for many years she was obliged to lie in bed during the first day or two. In recent years the flow had become so profuse as to constitute almost real hemorrhages. She suffered from terrific backaches and had consulted numerous physicians in the hope of getting some relief. Ten years previously the late Dr. Mundé had advised oophorectomy.

Examination revealed a large ovarian cyst in the right pelvis, and a number of smaller tumors extending over to the opposite

side of the pelvis. On October 8 a prominent gynecologist of this city, called in consultation, made a diagnosis of multiple fibroids of the uterus and advised waiting, in the hope that the menopause might bring about a spontaneous cure. After this she followed a course of treatment prescribed by a woman friend. She resorted to the use of a proprietary medicament inserted into the vagina and known as the "Balm of Figs." On December 26 she brought me a bottle of stuff which had come from the vagina and gleefully assured me that the "tumor had come away." My local examination, however, failed to confirm this happy state of affairs, and I felt constrained to inform her that the tumor was larger than ever. My friend, Dr. S. W. Bandler, was kind enough to microscopically examine "the tumor" in the bottle and coldly pronounced it to be "the lumen of the vagina and a portion of the cervix as eaten out by some powerful corrosive substance."

By April 10, 1902, the right-sided tumor had grown so rapidly that it reached the level of the umbilicus, and the other tumors had increased in size proportionately. I had never been swerved from my private opinion that we were dealing with multiple ovarian cysts. But the lady steadily and persistently rejected my advice to submit to operation.

Suddenly, during the night, she was taken with an attack of agonizing abdominal cramps, for the relief of which my office associate, Dr. N. Friedman, was called to her home. He administered morphine hypodermatically, which gave her only a little relief. On the following morning, when I saw her, she was suffering so intensely from pain over the right abdominal region, and every attempt to palpate the formerly insensitive right tumor caused such exquisite pain, that I made the diagnosis of torsion of the pedicle, with complicating peritonitis. I insisted on her immediate transfer to the Post-Graduate Hospital, and her sufferings were so fearful that she offered no opposition to the proposal.

On her arrival the acute symptoms subsided, and I decided to wait until the condition of shock passed over. After forty-eight hours she was operated on. A right-sided ovarian cyst was found rotated on its axis 360 degrees. There were several smaller cysts, multilocular in character and connected with the left broad ligament. All of the cysts were removed and she has been a well woman since.

Case III.—Miss X. G., æt. 20 years, was seen by me in consultation with Dr. G. E. Goldsmith, in the early part of June, 1904. She complained of intra-abdominal pain, constipation, and vomit-

ing. A round tumor of doughy character occupied the suprasymphyseal region and was strongly suggestive of the pregnant uterus. There was no history, however, of suspended menstruation, and examination of the breasts and pelvis gave negative results. The local examination, however, was not quite satisfactory, because of the presence of the hymen and the pain produced by vaginal or rectal exploration. She was ordered calomel and rectal enemata, and we decided to wait a little while. From this course of inactivity, however, we were suddenly roused by the unexpected supervention of an attack of acute intestinal obstruction. In spite of powerful cathartics and enemata, the obstipation became more and more complete, so that not even flatus was passed, and the vomiting became more and more frequent, until nothing was retained by the stomach. With this tympanites and general abdominal tenderness set in, so that it became quite clear that something radical had to be done. She was transferred to my service at the Post-Graduate Hospital on June 8 with a low grade of temperature, rapid pulse, and tympanitic abdomen. Efforts in the direction of overcoming the intestinal obstruction were instituted, and after the use of high medicated enemata, her bowels began to move. The tumor could now be clearly defined in the median line, and could be seen distinct from the general abdominal contour. A small hard mass was noted at its right margin, which had not been noticed at any of the previous examinations. (The operation later showed this to be the ovary, which gradually rotated to the front as the intraligamentary cyst twisted on its pedicle.) As the patient felt very much relieved after the intestine had emptied itself freely of gases and feces, we postponed operation until the patient practically recovered from a violent attack of mercurial stomatitis brought on by the free use of calomel.

On June 23 the patient's condition was so much improved that we decided to operate. The laparotomy brought to view a left parovarian cyst, which had become displaced in the right abdominal cavity, and the pedicle of which showed a twist of 180°. Circumscribed peritonitis had resulted in adhesions to adjacent structures. The tumor was removed and the girl made an uneventful recovery. She was discharged on July 23, 1904.

Case IV.—Mrs. S. K., age 26, married seven years, had three children, the youngest 2 years and 4 months old. In the month of February, 1904, Dr. M. Wolf of Yonkers invited me to examine this lady, on account of a right-sided attack of pain through which she had just passed, and because he suspected the presence

of a tumor. Although the patient had a bloody vaginal discharge at the time, she had not menstruated regularly, and as a result of the physical examination I concluded that she was about three months pregnant. The pain I attributed to an attack of right-sided renal colic. The examination of her urine by Prof. H. T. Brooks was negative. In May she missed her period, and until August it was continuously absent.

Toward the end of August, while she was sojourning in the Catskill Mountains, she was suddenly taken ill with abdominal pain, constipation, and vomiting. After three days' treatment by local physicians she was ordered back to the city for operation for acute intestinal obstruction. She suffered agonies during the trip and was transferred to her home in a private ambulance. I was requested to see her shortly after she reached the house. This was my second visit to the patient in six months. I found her in a condition of great suffering. Her pulse counted 160 per minute, and her temperature was 101° F. The abdomen was distended with a large tumor (which I took to be the pregnant uterus, near to or at term), and was exquisitely sensitive to the touch. The bowels had not moved in three or four days. There was incessant vomiting. The vulva was bluish in color, the cervix was soft, and the os admitted the tip of the finger. The palpable portion of the uterus was doughy. The large abdominal tumor seemed to be continuous with the cervix, but the exquisite tenderness of the abdomen prevented me from locating the fetal parts. There was a rapid pulse in the left iliac region, which I took to be the fetal heart. The breasts contained colostrum and were darkly discolored around the nipples. From these signs I concluded that pregnancy had gone on uninterruptedly to term.

Because of the evident complication of intestinal obstruction and peritonitis I had her immediately transferred to the Post-Graduate Hospital and invited Dr. H. J. Boldt to examine her with me again. As a result of the consultation, during which the patient was again carefully examined, it was decided to first try high rectal medicated enemata, and in case of failure, to proceed with artificial induction of labor. That same night the patient's bowels began to act and she got some relief from her urgent symptoms.

On September 6, having begun seriously to doubt the correctness of our diagnosis in regard to the presence of an uncomplicated pregnant uterus, I put this patient under the influence of an anesthetic, examined with the finger the uterine interior, and

felt the bag of waters. The abdominal mass, however, was noted as being peculiar by Dr. Boldt and myself. A child could not be felt. A bougie was passed into the uterus and the amniotic sac ruptured, allowing a moderate quantity of amniotic liquid to escape. During the next forty-eight hours several Barnes dilating bags were introduced into the cervical canal, and at the end of this time a three to four months macerated fetus, with umbilical cord and placenta intact, was spontaneously expelled. A large tumor extending up to the sternum was now readily discovered and diagnosticated as a right-sided unilocular ovarian cyst.

On October 1, having safely passed through the puerperal period without incident, I performed a median laparotomy. Numerous peritoneal adhesions were found, involving the omentum, intestine, and appendix. These were carefully separated, when the tumor was found to have suffered a torsion of the pedicle to the extent of one and one-half turns. Besides this, the tumor was found to have originated from the left ovary, but had gravitated into the right abdominal cavity. The pedicle showed evidences of beginning spontaneous amputation. The right ovary was markedly enlarged and cystic. On the advice of Dr. J. N. West, who happened to be present at the operation, I also removed it. The appendix showed pathological changes, and was likewise removed. The tumor weighed 3 kilos. The measurements were 8½x7½x 4¾ inches. The patient made an uneventful recovery and was shortly afterwards discharged entirely cured.

Case V.—Mrs. F. F., age 24, was admitted to Beth Israel Hospital on September 15, 1904. Her menses began at the age of 15 years, she married at the age of 17, and she had given birth to two children, the youngest 2½ years previously. Four years ago she had had an early miscarriage. Her last menstruation occurred 3½ months previously, and she knew that she was pregnant. One night about three weeks antedating her entrance into the hospital she was taken in her sleep with a sudden uterine hemorrhage. After this she saw blood daily during the following eight days. On admission the patient was found to present a pregnant uterus with a lacerated cervix. Her symptoms indicated an impending abortion. An attempt to prevent this failed, and the patient spontaneously aborted on September 22. On October 7 the patient had convalesced sufficiently to go home, but was prevailed on by my house surgeon to have the lacerated cervix repaired, in order, if possible, to prevent a recurrence of the accident. I was requested to supervise the operation. Up to this

moment I had not seen the patient. My house surgeon had similarly omitted to examine her carefully.

On the operating table I followed my invariable rule of examining the patient while under the influence of the anesthetic, when I readily discovered a right-sided ovarian cyst, possibly as large as a cocoanut. The operative plan was now changed and the patient placed in the Trendelenburg position. The usual abdominal incision was made, and the tumor, free from adhesions or signs of peritoneal irritation, was found to have a pedicle showing 3½ turns from left to right, which led down to the left broad ligament. There were no evidences to the naked eye of circulatory disturbances in either the pedicle or the tumor. The former looked like the umbilical cord of a newly-born child. The right adnexa were examined and found to be normal. The tumor proved to be a parovarian cyst. The abdominal wound was closed in the usual manner and the patient made an uneventful recovery.

Case VI.—Mrs. R. M. was referred to me by my friend Dr. Max Levy of Brooklyn. She was 39 years old and the mother of six children. Her last menstruation was overdue several months. She presented no urgent symptoms, only complaining of some abdominal soreness, backache, and a sense of weight in the pelvis. Examination under anesthesia discovered a soft tumor in the suprasymphyseal region, and although I had diagnosticated previously an ovarian cyst, a suspicion of possible pregnancy crossed my mind and became so fixed that I decided to postpone the operation. A careful examination was made several days later by Dr. Boldt and myself, when it was found that the tumor had shifted its position somewhat laterally, and the somewhat enlarged uterus could be felt independently and behind the tumor.

On November 21, 1904, I did a laparotomy and found a large multilocular right-sided ovarian cyst, with a twisted pedicle showing 3½ revolutions in the vertical axis. A portion of the surface of the cyst had a dark appearance. The uterus was larger than normal, had a congested appearance, and strongly suggested pregnancy. The pedicle was quite long, so that in Trendelenburg position the tumor fell well up toward the diaphragm. There were no adhesions. The right Fallopian tube was elongated, flattened, and inseparably attached to the upper surface of the cyst. Some portions of the twisted pedicle looked hard and cheesy. The blood-vessels of the pedicle were large and bled freely. After careful independent ligation of the bleeding points the cut border of the broad ligament (from which the tumor was excised) was

sewed over with a continuously running catgut suture, and the abdominal wound was closed in the usual manner. There was some uterine bleeding during several days after the operation, but no signs of an abortion. Otherwise the patient's recovery was progressive and uneventful.

Case VII.—Mrs. M. F., æt. 28, admitted to Beth Israel Hospital, as a walking case, on January 5, 1905. Menstruation began at the age of 14 and was of the four-weekly type. She was married eight years and had had three children, the last one a year ago. She had never had a miscarriage. While washing and lifting heavy wash-boilers about six weeks ago she was suddenly taken with severe pain in the right lumbar region, which traveled downwards and forwards in the direction of the right groin and thigh. With this she suffered from painful and frequent micturition. A physician pronounced her pregnant and administered morphine hypodermatically. This attack subsided, but was followed eight days later by another one, and since then by about ten similar attacks. Two weeks ago a similar severe attack occurred on the left side, and another one three days ago. In the intervals she complained of frequent and painful micturition, with more or less backache. She claims that she has lost thirty pounds in flesh since the first attack, and has grown very weak. Pelvic examination reveals the right pelvis filled with a vague, doughy mass. The uterus cannot be clearly defined, but seems to be retroverted. The os and cervix do not suggest pregnancy. Temperature, on admission, 102° F., pulse 100, respiration 28.

On opening up the peritoneal cavity on the following morning through a median abdominal incision, a black tumor, with the very much swollen and congested Fallopian tube above, was recognized as an ovarian cyst the size of a cocoanut, the pedicle of which had rotated twice on its axis and strangulated the circulation of the mass above. Although occupying the anterior half of the right lower abdominal region, the pedicle was followed down into the left pelvis. After unraveling the twist the pedicle was seized in clamps, the tumor removed, and hemostasis provided for with ligatures and a continuous broad ligament suture. A three-chambered cyst of the right ovary, about twice the size of the first tumor, was now discovered, reaching as high up almost as the liver. After extending the incision in the abdominal wall upwards sufficiently, this second tumor was delivered, and presented a pedicle showing 2½ turns. The Fallopian tube, situated behind the tumor, was elongated, but showed no evidences of strangu-

lation. The cyst itself looked white and glistening. At only one point in the pedicle was there beginning evidence of disturbed circulation. So that, although the left-sided tumor was clearly gangrenous in appearance, that of the opposite side showed little signs of disturbed nutrition. The second tumor was exsected like the first, and a ventrofixation of the apparently normal uterus done. The wound was closed without drainage. The patient made an uninterrupted recovery.

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THE TREATMENT OF FIBROID TUMORS OF THE UTERUS.*

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This subject, though considered a hackneyed one, and this idea emphasized by the frequent presentation to medical and gynecological societies of gross specimens of uterine fibroids with histories limited to symptomatology, really deserves the most careful consideration.

The personal equation enters largely into the conclusions drawn as to the proper treatment of these neoplasms. The practitioner who saw these cases commonly before operation for the removal of such tumors and who did not perform these operations, possibly do not so well remember the cases that terminated unfavorably or rendered their hosts permanent invalids, as those that passed along satisfactorily without operation or those that succumbed to operation. The surgical enthusiast who has served as an intern in a hospital where he has assisted in many operations perhaps thinks all fibroids should be removed, basing such opinion largely upon the success of that character of surgery he has experienced.

Still another class, composed of general practitioners and most surgeons, take a middle or so-called conservative ground, believing those fibroids giving marked trouble should be removed and all others unmolested. In recent years a few others have, from careful analysis of cases and study of the tissues removed,

* Read before the Medical Society of the District of Columbia, March 29, 1905.

reached the conclusion that no fibroid tumor of the uterus should be considered perfectly innocent.

The careful study of pathological tissues is recognized as being the most reliable source of information upon which to base therapeusis. This statement applies to uterine fibroids and their complications equally as well as to the various other pathological conditions encountered in medicine. That the complications and degenerations of these neoplasms require most careful consideration, is evidenced by the reports of Noble,[1] Cullingworth,[2] Ellice M'Donald,[3] Martin,[4] Frederick,[5] Scharlieb,[6] Hunner[7], Webster,[8] and others. Previous to January 31, 1904, Noble[9] had subjected to careful study 278 cases of uterine fibroids upon which he had operated. Scharlieb carefully analyzed 100 cases, M'Donald has studied 280, Martin 205, Cullingworth 100, Frederick 125, Webster 210 and Hunner 100 cases, thus furnishing us with results of the examination of the conditions in 1,398 cases operated upon. It would seem that a careful scrutiny of the degenerations and complications met by these authorities should furnish abundant material upon which to base reliable conclusions as to treatment. In these 1,398 cases the following summary of degenerations and complications may be made, by combining the very complete tables of Noble and Webster.

TABLE OF THE DEGENERATIONS AND COMPLICATIONS IN A SERIES OF 1,398 CASES OF FIBROIDS OF THE UTERUS OPERATED ON OR REPORTED BY NOBLE, CULLINGWORTH, M'DONALD, MARTIN, SCHARLIEB, FREDERICK, WEBSTER AND HUNNER.

Carcinoma of the corpus uteri	29
Epithelioma of the cervix	12
Adeno-carcinoma of the cervix	1
Epitheliomatous infiltration of fibroid tumor arising from adeno-carcinoma of the corpus uteri by metaplasia	1
Sarcoma	24
Chorioepithelioma	2
Myxomatous degeneration	48
Cystic degeneration of tumor	53
Edema of tumor	17
Calcareous infiltration of tumor	28
Necrosis of tumor	78
Twisted pedicle, pedunculated tumor	3
Intraligamentous development of fibroid	45

Subvesical developments of fibroid	2
Hyaline degeneration of tumor	69
Hyaline degeneration and calcareous infiltration	8
Adenomyoma	8
Hemorrhagic degeneration of tumor	13
Fatty degeneration of tumor	7
Suppuration of tumor	10
Procidentia uteri	12
Retroversio uteri	15
Pregnancy	7
Ectopic pregnancy	3
Ectopic pregnancy, salpingitis, hydrosalpinx	1
Dermoid cyst, bilateral; umbilical hernia	1
Dermoid cyst, suppurating, sinus through abdominal wall	1
Dermoid cyst, with twisted pedicle	1
Dermoid cyst	2
Ovarian cyst	59
Ovarian cyst with twisted pedicle	2
Ovarian cyst, suppurating	1
Ovarian cyst, bilateral	2
Ovarian cyst, unilateral	22
Ovaritis, unilateral	3
Ovaritis, bilateral	29
Cystic degeneration of ovaries	78
Calcification of ovary	1
Ovarian fibroma	3
Ovarian carcinoma	2
Papillary carcinoma of both ovaries	1
Hematoma of ovary	1
Parovarian cyst	7
Broad ligament cyst	2
Abscess of ovary	1
Abscess of ovary, single	5
Abscess of ovary, double	2
Tubo-ovarian abscess	2
Pyosalpinx (unilateral 9)	20
Pyosalpinx bilateral	11
Pyosalpinx with tubo-ovarian abscess	2
Abscess of broad ligament	1
Hematosalpinx	8
Hydrosalpinx	25
Hydrosalpinx, bilateral	15

Hydrosalpinx, unilateral	18
Hydrosalpinx and tubo-ovarian abscess	1
Salpingitis	46
Salpingitis, bilateral	2
Salpingitis, unilateral	10
Salpingitis and hydrosalpinx	3
Salpingitis and tubo-ovarian abscess	3
Salpingo-oophoritis, unilateral	7
Salpingo-oophoritis, bilateral	42
Fibroma of Fallopian tube	1
Papilloma of appendages	1
Appendicitis	40
Hernia	4
Hernia, ventria	1
Hernia, umbilical	3
Carcinoma of umbilicus	1
Tuberculous peritonitis	1
Universal adhesions	4
Adhesions to viscera	6
Adhesions to tumor	5
Varicose veins of pelvis	4
Thrombosis of veins of lower extremities	2
Total	1,011

In this table we note among the varieties of degeneration of the tumor or the uterus that cancer was present in the body of the organ 32 times and in the cervix but 13 times. Sarcoma was found 24 times, myxomatous degeneration 48, necrosis 76, cystic degeneration 13, twisted pedicle of a pedunculated fibroid, 3, suppuration 10, adenomyoma 8 and pregnancy 7 times.

Among the complications may be noted 295 cases of inflammatory conditions of the appendages, 51 being suppurative and the remainder cases of adhesions, non-suppurative inflammation, hydrosalpinx, hematosalpinx, etc. Cancer of the ovary was found 3 times and of the umbilicus once. Dermoid ovarian cysts were encountered 3 times in which twisted pedicle and suppuration were complications. Ovarian cyst was found 86 times, and here again twisted pedicle and suppuration were noted. Papilloma was present twice and ectopic pregnancy four times. In 40 cases appendicitis was mentioned though silence as to the variety is unfortunate. There were 8 cases of hernia, 7 parovarian and 2

broad ligament cysts. Fibroma of the ovary was found three times and of the Fallopian tube once. The total of cases of cancer of the uterus and the appendages was 48.

We learn form this analysis of 1,398 studied cases of uterine fibroids and their complications that, without operation 18 per cent. of them would have died from degeneration of the tumor or of the uterus and 19 per cent., a very conservative estimate, from the existing complications. This makes a grand total of 37 per cent. of this large collection of cases of fibroid tumors of the uterus that would have died had no operation been done. A very considerable proportion of these degenerations and complications were not discoverable before operation. The large percentage of cases of cancer in the body of the uterus is of special moment, it having been found in that part 32 times, as compared with 13 times in the cervix—a relative increase of ten fold. Certainly diagnosis of this condition in the body of the uterus complicating fibromata would have been well nigh impossible. There were about 140 cases of malignant degeneration, or about 10 per cent.

It is not held that all the 1,011 different degenerations and complications found were directly due to the presence of the fibroid tumors. We are justified, however, in asserting that the marked increase in the proportion of malignant degeneration of the body is induced by the presence of the tumor. When epitheliomatous infiltration of the fibroid occurs, it has probably originated from islands of glandular tissue included, as pointed out by Cullen. Sarcoma developing from the tumor more commonly springs from the connective tissue than from the muscular elements. Evelt has made a study of this subject and has reached this conclusion. Rarely it develops here secondarily to some other location. In a specimen removed by Webster, sarcoma was found in the center of each of three interstitial fibroids. The patient died in few months from sarcoma in the lung, which was considered the primary site of the disease. Appendage disease of an inflammatory nature was found 295 times—21 per cent. of the cases. Webster found it in 99 of his 210 cases—47 per cent., and Lawson Tait estimated it as 50 per cent. in his work. That it is an exceedingly common complication is apparent. The histories of fibroid cases abound with acute attacks of this nature. The presence of 86 ovarian cysts was probably largely the result of the inflammatory mischief set up. Besides these tabulated details cardiovascular conditions, as well as such

ulterior manifestations as mental aberration have to be remembered as complications of uterine fibroids.

M'Donald found that in 175 autopsies made in women in the Bender laboratory, 26 of them had uterine fibroids. This proportion of 14.8 per cent. agrees with the statistics given by other pathologists. It is evident that by no means all of these women had notable symptoms referable to the presence of these tumors. It is well known that the symptoms from them, like those of the early stages of cancer of the same organ, are unreliable as indications for treatment.

Small tumors may be so located as to furnish no evidence of their presence and again they may be very distressing. The same may be said of larger ones. I have no desire to here discuss the treatment of such tumors from the viewpoint of symptomatology. I prefer to be guided entirely by the evidence herein offered from the pathological side of the question, believing from a considerable experience and the analysis of these 1,398 cases already offered, as compared with the very small mortality rate accompanying operation for the removal of these growths, even though the complications are so common. I believe the scientific treatment of fibroids should always be extirpation. If this rule becomes customary these tumors will be removed early—before the complications and degenerations have so commonly occurred and hence with a mortality of perhaps a fraction of one per cent. instead of two to five as at present.

It may be argued that these statistics are based only upon cases operated upon, and that such complications and degenerations do not exist as frequently in all cases. That is only evidence that they should be removed before such conditions develop.

Having decided these tumors should always be removed, the procedures by which this is to be accomplished deserves consideration. The main points to be decided are whether myomectomy or hysterectomy should be done and whether by the abdominal or the vaginal route.

When the tumor, or tumors, if but few in number, can be easily removed, leaving a practically healthy uterus, this should be done, but under the following conditions:

First. if the patient be of the child-bearing age, especially of less than forty years; second, if future pregnancies are desired or if pregnancy be co-existing; third, if a tube and ovary, probably capable of performing their functions, can be retained. Even

though these organs are of opposite sides, this rule would hold, and fourth, if no apparent evidence of malignant disease is noted.

Under all other conditions hysterectomy should be the operation. Whether the uterus should be amputated near the internal os or removed in entirety, is a question to be determined. Considering the fact that cancer of the organ was found 45 times and sarcoma of it 24 times, a total of 81, or 6 per cent., in the 1,398 cases, the conclusion inevitably reached is that the scientific procedure must be total hysterectomy rather than any amputation. In fact, this point very strongly suggests the inadvisability of myomectomy. The advantages of supravaginal amputation as compared with total excision of the uterus, are that the operation is accompanied by less danger to the patient, and that a better support to the vaginal roof with less interference with the vaginal dimensions can be secured. As to the route, the larger proportion will be best done by the abdominal one, inasmuch as complications may best be dealt with by it, and tumors of the broad ligament or of diameters in excess of three inches are more safely and easily removed by it. By the vaginal route myomectomy for tumors having larger diameters, cannot easily be performed, even though large openings into the peritoneal cavity be made in front of or behind the uterus. Besides the traumatism to that organ is greater in vaginal myomectomy than when that operation is done by the abdominal route. An exception to this rule, however, is the condition of sloughing or pediculated submucous fibroid tumors, in which case the operation should practically always be done without opening the peritoneal cavity.

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THE ROCHAMBEAU.

CILIATED CYSTS AND GLANDS OF THE UTERINE, TUBAL, AND PELVIC SEROSA.

BY

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(With 23 illustrations.)

In conditions of peritonitis, as well as many other conditions of the female genitalia, there may be found upon the surface of the uterus, tubes, and pelvic wall, certain little cysts and glands, lined with a taller or shorter, sometimes ciliated, sometimes non-ciliated, columnar epithelium.

It is concerning the history, description, and significance of these little cysts that I wish to speak to-night.

The subject was suggested to me, and the material furnished, by my respected teacher, Dr. Ludwig Pick, of Berlin, and I have to thank him for explanations and suggestions throughout, as well as the use of his laboratory facilities, library, and prepared specimens.

The metaplasia of flat endothelium of serous surfaces to tall columnar epithelium is well known to pathologists, in the occurrence of little cysts between chronic adhesions, *e. g.,* of the spleen, surface of the epicardium, tunica vaginalis testis, etc., etc. Little cysts or tube-like ingrowths, lined by columnar epithelium, are often found.

The first diagrams of such cysts of the tubes and uterus occurs in Virchow's "Geschwülste." These were hemp-seed to pea-sized vesicles, often lined by columnar epithelium, and easily distinguished from endothelial and lymphangiectatic cysts, etc. Virchow regarded these cysts as new growths, but at first no one agreed with him. Their origin had been attributed to the Wolffian body, Wolffian duct, displaced germinal epithelium, infolding of hypoblast, misplaced epithelium from Graafian follicles, secondary Fallopian tubes, to uterine or tubal mucous membrane reaching the serosa, and to inflammatory hyperplasia of germ epithelium of ovary onto the surface of tube and broad ligament.

The enormous number of attempted explanations shows the extreme difficulty pathologists have found in placing these little cysts in their scheme of things. Perhaps the failure, commonly, to find cilia has added to the difficulty, and led *ciliated* subserous cysts

of ovary and tube to be considered apart from *non-ciliated* cysts of the uterus.

Dr. Pick, in his "Referat," published the first account of ciliated cysts of the uterus. There is only one other published case in the literature, that of Siegfried Neuman (*Archiv. für Gyn.*, Vol. 58), and this case is by no means clear. Suffice it here to say that Neuman found such adenomatous cysts of ovary, uterus, and tubes, all in the same case, and attributed their phenomena in each instance to a different cause, those of the tube to the parovarian, those of the uterus to transplanted remains of the Wolffian body, and those of the ovary to primordial kidney remains.

We shall hope to present an explanation clear and simple, and that refers all these similar little subserous cysts to a common cause.

In 1897, Fabricius published the first thorough description of such ciliated cysts upon the serous surface of two Fallopian tubes from the same patient. Unfortunately, he had already thrown away the uterus and ovaries, and could not determine if similar cysts existed in them. He made serial sections, and tried to study out their origin. *A priori,* he considers that they may have one of two origins: (1) They may be due to direct transformation of peritoneal endothelium; and (2) they may be due to an outward growth of the germinal epithelium of the ovary, upon the surface of the tube. He concludes in favor of the latter theory, erroneously I believe. His diagrams present splendid transformations and gradations of a surface cubical epithelium of these glands. Had he examined uteri and peritoneum of the pelvic wall with similar cysts, he might have found, as we have, similar transformations too widely removed from the ovary to admit of the possibility of the overgrowth of epithelium from the surface of the ovary.

Dr. Pick demonstrated before the Berlin Med. Soc., in 1900, and published in the *Berlin Klinische Wochenschrift,* the first cases of ciliated cysts of the pelvic serosa and uterus. The report was brief, a mere notice of the work and findings, and the task of amplifying these findings he turned over to me, with his theory as to their origin. He had, during a number of years, observed multiple cysts, sometimes ciliated, of the pelvic serosa. He found them in all conditions of the pelvic organs, such as the hyperplastic myomatous or non-myomatous uterus, parametritis and perimetritis, and even in healthy genital organs.

These cysts he believes to be due to the metaplasia of flat peri-

toneal epithelium into columnar epithelium. The property of forming cilia belongs in the embryo to the pelvic peritoneum. They are found in the Wolffian body, Wolffian and Muellerian ducts, surface of the ovary etc., etc. While the heart, lung, diaphragm, etc., are passively covered by the embryonal peritoneal layer, the superficial epithelium of the urogenital fold is making active ingrowths and outgrowths in the stroma of the mesoderm, forming the mesonephros, Mueller's ducts, etc. The epithelium of the genital fold becomes the pelvic peritoneum. Hence the universal ability of the superficial pelvic peritoneum to form, in post-fetal life, ciliated epithelial cysts, and larger or smaller ciliated adenocystomata, is nothing *less than a specific* property of the same present in fetal life, and preserved until maturity *under certain circumstances.*

Robert Meyer, in a long and thorough study of "Cysts, Glands, and Adenomata in the Myometrium of Adults" (*Zeitschr. f. Geburtsch.,* Bd. 44), discusses all possible origins for cysts or cyst adenomata of the uterus. He finds the following causes:

1. Coming from the uterine *mucosa* are certain cysts in the alæ, and near the mucosa. He ascribes their misplacement to connective tissue retraction.

2. From the tubal mucosa, certain cysts near the isthmus of the tube.

3. From Gartner's duct, certain cysts, recognizable from the characters of that duct.

4. Certain others, with long, zigzag ducts, he could not account for.

5. Subserous cysts, of which he collected nine cases, he assigns to various causes. Some he ascribed to fetal ingrowth of peritoneum; others he thinks may come from Gartner's duct; one from Mueller's duct, and two cases advantageously located, he thinks, may come from ingrowths of ovarian epithelium. He found these cysts usually in the lower third of the uterus, though all localities were represented. The epithelium varied from flat to tall, becoming flatter toward the serosa, in those cases where an opening on the serous surface was present. Usually there were adhesions on the serosa.

He considers it proven that endothelium may be transformed into columnar epithelium, but not to ciliated epithelium, as he had no cases of ciliated cysts of the uterus. He finds no proof of fetal misplaced tissue, and only assumes it in certain cases, for lack of any simpler explanation.

We are impressed by the diversity of explanation in all this, and

also that his belief in the metaplasia of endothelium stops short of cilia-formation.

The work of Muscatello and Brunn gives some explanation of the difficulty with which cilia are preserved. They also got no cilia in their slides, except with special care, and special methods.

Max von Brunn (*Centralblatt f. Pathologie,* 1900) gave a short report on his study of the pleura and pericardium of dogs. By introducing a foreign body into the pleura, he secured the development of a ridge of ciliated endothelium. He has pictures of ciliated pleural epithelium varying from flat to cubical.

In the frog, ciliated peritoneal epithelium has long been known to exist. An Italian, Paladino, has also found cilia in the normal pleura and peritoneum of arachnoids. Von Brunn thinks that the rapid decomposition of cilia is the cause of the scarcity of reports in this line. He also *saw no cilia,* except by very careful handling. He killed his animals by a blow upon the head, and within a very few seconds he had the organs floating in a four per cent. formalin, without removing them from the body. He afterward hardened them in alcohol, as usual. He feels sure that he could find cilia in *fresh* human material, if he could treat it similarly.

He thinks his work is important, as proving the *true epithelial* nature of the serosa lining cells.

Muscatello, in Virchow's Archivs, 1895, in connection with some work on the absorption of solid particles through the diaphragmatic pleura, examined much human and animal material by hardening with osmic acid, reducing with tannin, with the result that he frequently found *cilia* in the normal peritoneum, thereby confirming the work of Paladino and Kolossow. In the unhardened material, however, he did not find cilia. He speaks of Paladino having done so (I was unfortunately unable to read the original, in Italian), and having watched the vibrations of the cilia.

Gustave Schickele, of Strassburg, describes a number of such ciliated cysts as we have found, but found them *only* on the tube, and broad ligaments, never on the uterus and pelvic wall. He naturally fell into Fabricius' explanation of their origin, that they came from the germinal epithelium, which had grown over on to the tubes and broad ligament. His work is remarkable for the beautiful picture of epithelial knots upon the surface of the tube, the counterpart of which pictures I can show from my own drawing. Exactly on the surface of the peritoneum, often in some small ingrowth, appear these solid masses of epithelial cells. Their characters are not distinguishing. There is nothing in

them to prove that they *are* or are not from either the germinal epithelium, or the peritoneal epithelium.

Robert Meyer, in a later article (*Virchow's Archivs,* 171), finds vast numbers of similar epithelial nodes, on the tubes, broad ligaments, testacles, and epididymis. He seems to have adopted Pick's explanation that they *must* be metaplastic peritoneal structures. Of course, if they are, the cysts which we are considering have the same origin, for the close relation between the little subserous cysts and the solid epithelial knots occupying the same relative position, is unquestionable. He reports fifteen cases of these nodes.

I shall now take up my results, with a brief analysis of the cases. I found in all seven cases presenting these cysts of pelvic peritoneum, and I know that there are several others in the collection of Dr. Pick.

Case I.—Frau E. G., 32 years old, a locksmith's wife. One brother died of phthisis. Menses began with the fifteenth year, were regular and painless. Five months previously to operation she was curetted for incomplete abortion, and she thinks that the womb has fallen since then. Has had three normal labors and two abortions. For three months previous to operation she had cramp-like pains in the abdomen and back, and bad headache. She has worn a pessary and recently complained much of pain in the back and abdomen, and bladder pressure, and evil taste in the mouth.

Physical Examination.—General examination negative. Uterus slightly enlarged, retroverted, slightly movable. Adnexa free.

Diagnosis.—Retroflexio-uteri mobilis. Metritis hyperplastica.

Operation.—15/IX, 99. Under ether. Vaginal hysterectomy with clamps. A slight hemorrhage followed. Convalescence feverless and uneventful.

Pathology.—Gross description. Uterus with both adnexæ 9.5 cm. long. Tube, 5 cm. long, 5 cm. thick. Mucous membrane of cervix smooth. Perimetrium smooth but thickened. Endometrium soft, swollen, hemorrhagic. A cross-section under insertion of the ligamentum rotundum shows myometrium over 2 cm. thick, hyperplastic.

Microscopic.—The uterus presents internally the usual changes of an endometritis hypertrophica. The muscular wall is somewhat thickened, otherwise normal.

Just beneath the peritoneal surface lie numerous cystic formations, occasionally one opening upon the surface, and hence having

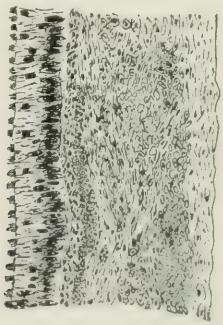
a gland-like character. These bodies vary in size from two or three millimeters long, to tiny ones quite invisible to the naked eye. They are lined with columnar epithelium, varying in height from cubical to very tall. In many of the cysts cilia are well preserved, while others do not show them. There are occasional



Fig. 1. Case I.—Subperitoneal Cyst of Uterus.

small papillary projections into the cysts, but none reach any great degree of complication. The cyst which I have drawn shows the character of these projections very well. (Fig. 1, Case I.)

The *stroma* is rather rich in cells, and the nuclei stain deeply. Many of the other cases, with smaller cysts and no projections, showed stromata much poorer in cells. Psammoma bodies are abundant in the cysts and in clefts between peritoneal adhesions.



High Power (Leitz VIII) of Fig. 1 at *a*.

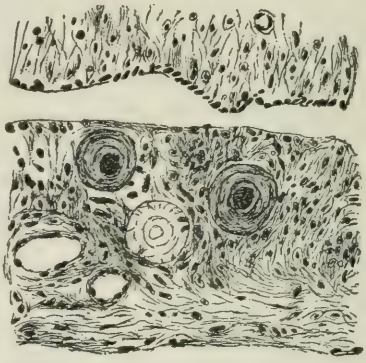
The ovary in this case showed also many small, simple ciliated cysts. The ovary itself is small, shows a developing Graafian follicle. In each section one may count three to five cysts. They resemble very closely the cysts of the uterus already drawn.

Case II.—Frau L., aged 43 years. As she was a private patient,

according to the custom at Landau's clinic, no history was written. She was admitted to hospital, Dec. 4, 1899, with a diagnosis of metritis hyperplastica, perimetritis adhesiva, and endometritis hyperplastica. She underwent a vaginal hysterectomy, the uterus being removed by morcellation. She was discharged from the



Case II. Fig. IV.



Case II. Fig. I.—Cleft in Pelvic Peritoneum.

hospital after eighteen days, but returned two weeks later with multiple peritoneal abscesses, one subdiaphragmatic, being on the right side. Thereafter she passed three months in the hospital



Case ii. Fig. ii.

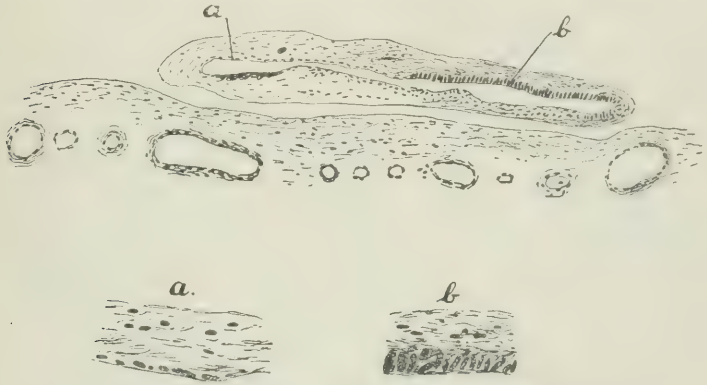
and underwent a prolonged sepsis, but was discharged on the 21st of April, 1900, well.

Gross Description.—Specimen consists of uterus split in the middle anteriorly, and left adnexa, and measures 11 cm. in length. Cervix, 5 cm. long.

Mucous membrane of the cervix and cervical canal smooth and yellow. Myometrium of cervix 1.5 cm. thick; of corpus, 3 cm. thick. Endometrium in part lacking, in part hypertrophied. Perimetrium thick and tough, especially on fundus and dorsum. There is a bean-sized myoma on the surface of the uterus. Left tube 8 cm. long; ovary somewhat enlarged.

Diagnosis.—Metritis and endometritis hyperplastica. Uterus myomatous.

The microscopic sections were made in series, from the anterior and posterior peritoneal surface, with considerable musculature attached; in fact, the piece was cut nearly through to the mucosa. The crescentic section shows its entire peritoneal surface studded with little cysts, seldom more than 2 mm. in diameter, but most of



Case II. Fig. III.—Band of Adhesions on Surface of Uterus.
a. High-power view from *a*.
b. High-power view from *b*.

them distinctly visible to the naked eye, looking like a row of bubbles.

The description of these little cysts I will again leave chiefly to my drawings marked Case II, only saying that the little calcareous concretions are very numerous in this case, and the stroma is not especially rich in cells. Immediately beneath the peritoneal surface, the endothelium of which is usually lost, is a very vascular layer, the vessels being so numerous that they give a porous appearance to the eye. The high power appearance is well shown in Case II, Fig. IV.

Fig. I shows a cleft between peritoneal adhesions lined with rather irregular epithelium, and beneath which are several psammoma corpora. Fig. II shows a very small superficial ciliated cyst,

which is quite typical of the group. Fig. III shows a flat band of peritoneal adhesion cut across, with a flat cavity enclosed, and lined with an epithelium which varies from columnar to flat in the same section, and is, for instance, at "*a*" very atypical and non-ciliated.

Fig. V shows a complicated glandular formation from the same case, opening upon the peritoneal surface. The epithelium is non-ciliated, or the cilia are lost.

Fig. VI is a small cystic cavity, nearly filled by a papillary projection. The papilla is cut somewhat diagonally, which detracts from its value, but I drew it to show the varying heights of the epithelium on the papilla, and lining the general cavity.

Here and there among the cysts solid epithelial nodes were found, but these were so much more abundant upon the surface



Case II Fig. V.—Peritoneal Gland-Formation on Surface of Uterus.

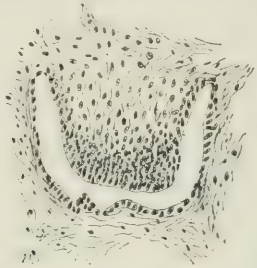
of the tubes that my drawings of the solid nodes are from that organ.

The tube is surrounded by adhesions and richly supplied with blood-vessels. Tubal mucosa seems normal, but in the folds of the mucous membrane are numerous psammomata.

Upon the surface are very many of the cell group or nodes, fairly represented in Fig. XII. These nodes are usually solid, sometimes somewhat loose and broken in the center, as in the figure. These nodes usually have the same special investment of con-

nective tissue that the cysts have, and some of the cysts indeed whose walls have several layers appear as though they might have been formed from the breaking-down of such a node. Unfortunately, I neglected to draw one of them.

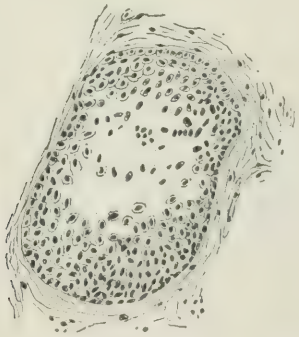
I believe that to be the history of the formation of some, but perhaps the lesser number, of these cysts. Exactly similar epi-



Case 2. Fig. VI.—Subperitoneal Cyst with Papillary Ingrowth.

thelial nodes are found in a series of cases from the tubes, broad ligaments, testicles, etc., by Robert Meyer and others, and variously explained.

We have also here and there beneath the *tubal* peritoneum little glands lined by ciliated epithelium, exactly like those to be found on the uterus, as in Fig. X, and we have *papillary* ingrowths of solid epithelium, as in Fig. XV, without an enclosing connective



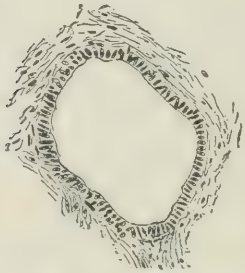
Case II. Fig. XII.—Epithelial Node on Peritoneal Surface of Tube.

tissue capsule. Fig. XIV represents one of the fissures or clefts upon the surface of the tube, which are so common, lined by an epithelium, somewhat flatter at the bottom of the cleft.

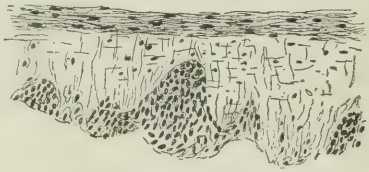
The ovary in this case is enlarged, measuring 4 by 2½ cm. It shows a large number of tiny cysts, from pinhead-size down. These cysts are lined by a single layer of columnar epithelium, in

which I did *not* distinguish cilia. They may or may not have been present and disintegrated, as the cilia in the preceding case, and other cases, were found on uterus, ovaries, and tubes. The ovary possesses the same superabundance of psammoma kernels.

The epithelium of the cysts varies from cubical to very tall. The stroma is not especially rich in cells.



Case II. Fig. X.—Gland from Surface of Tube.



Case II. Fig. XV.—Papillary Ingrowths—Surface of Tube.

On the surface opposite the hilum are beautiful ingrowths of germ epithelium, which is in other parts of the specimen for the most part lost. These ingrowths, shown in Figs. XI and XIII,



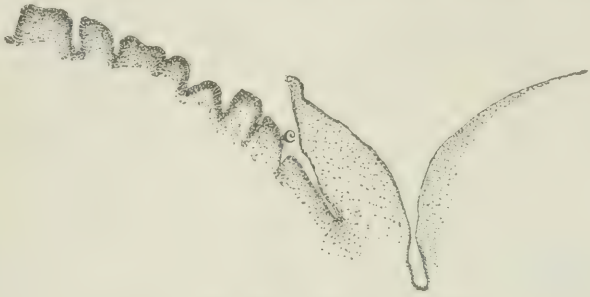
Case II. Fig. XIV.

vary from short cubical epithelium to very tall columnar. This picture is precisely analagous to those von Kohlden has drawn, in his classical work on ovarian cysts, though I thought it presented a more favorable specimen than any that he drew.

In several cases of parametritis and perimetritis I found long split-like cavities, lined by epithelium, flat or oval in form, often

several cells thick. From one of these cases, Frau F., I sketched a bit of peritoneum, with its infoldings and thickenings. While the general impression is clear, the outlines of cells were not sharp in these cases, perhaps due to a short period of drying in the air before the material was preserved.

I therefore have left out several of these cases that I should have wished to report, because the material, though instructive,



Case II. Fig. XI.—Surface of Ovary.

was not perfect. In the case drawn there was a pea-sized parametrial cyst, lined somewhat irregularly by several layers of oval epithelium, very likely a cyst resulting from one of the solid nodes described under Case II.

Case IV was operated upon in 1894 by Dr. Theo. Landau, and was a case of adenocystoma papilli ferun ovarii duplex, in a woman 36 years old. The uterus, tubes, alæ, Douglas' folds and even part of the parietal peritoneum to the pelvic inlet were covered with clear vesicles, ranging up to pea size. The uterus was



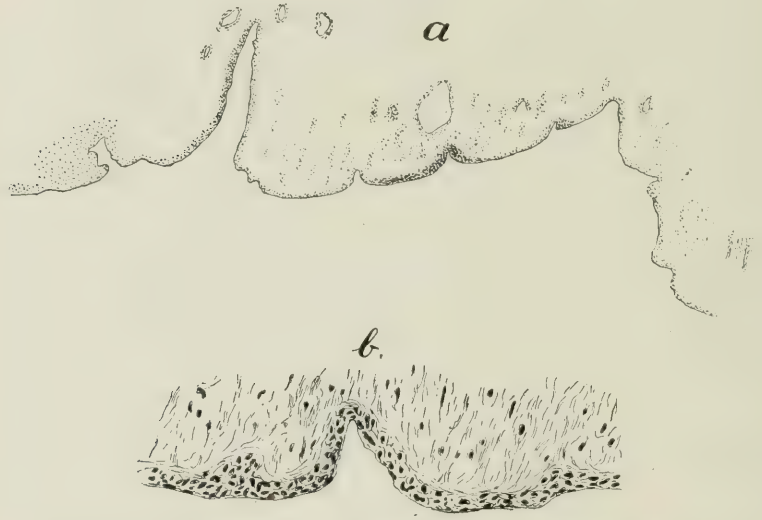
High Power View from *a* and *c*. (Case II. Fig. XI.)

extirpated to quell the hemorrhage, as the ovarian tumors extended deep into the pelvic connective tissue. Pieces of the peculiar peritoneum were saved for microscopic examination.

Microscopic examination showed that the little cysts of uterus, tubes and ovaries agreed in all particulars with the ovarian tumor, *i.e.* were lined with ciliated epithelium, showed here and there the formation of glandular twigs, and little papillary projections

into the interior of the cyst. These were not probably metastases, as the patient lives and is in good condition, but have more probably arisen from the independent proliferation of the pelvic serosa. This proliferation drives solid and tubular twigs into the connective tissue which develop into subperitoneal cysts, by means of the metaplasia of squamous epithelium to ciliated cylindrical epithelium. (See Case V, Figs. 4, 3, 2 and 1.)

At the time of the operation in this case, Prof. Landau and Dr. Theodore Landau regarded the prognosis as probably bad, as they thought the cysts of the uterus and pelvic peritoneum generally



Infoldings and Thickenings of Chronic Pelvic Peritonitis, with High Power View of Same.

were metastases. However, six years later the patient was quite well, although the pelvic peritoneum had been left studded with these cysts.

One more case, Case VI, was a case of multiple fibroid and chronic peritonitis, in which abdominal hysterectomy was performed.

Gross Description.—Uterus with adnexæ 11 cm. long. Mucosa of normal appearance. Mucous membrane of portio vaginalis smooth. Body of uterus 8 cm. long. In cervix some small fibroids. Parametrium rough. Myometrium soft in consistency. Numerous cysts under the peritoneum of the uterus, partly with

clear, partly with dark contents. Ovaries with follicle cysts. Numerous small cysts upon surface of ovaries and tubes.

The cysts in this case are not ciliated. I cut the specimens in this case myself, but find that they answer, substantially, the de-



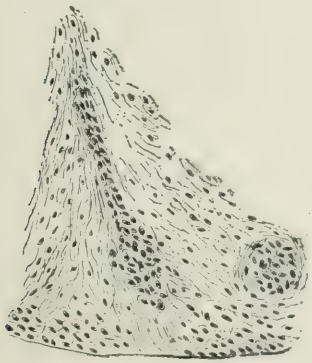
Case V. Fig. IV.—Solid Ingrowth Expanded to Cyst.



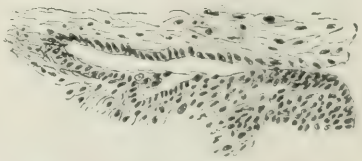
Case V. Fig. IV.—High Power from *a*, *b*, *c*, and *d*.

scription of those in Case I, although they are larger and less numerous.

I have a couple of slides from this case to present, merely that you may view the object as well as the illustration.



Case V. Fig. III.—Solid Peritoneal Ingrowth and Epithelial Node.



Case V. Fig. II.—Tubular Peritoneal Ingrowth—Surface of Uterus.

Now, whence come these structures? I have already stated the variety of explanations given for them.

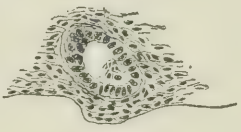
Von Kahlden has, in two masterly articles, proven the direct

origin of many cases of adenomata simplex serosa and hydrops folliculi of the ovary, as well as proliferating and ciliated cysts of ovary from the metaplasia of the ovarian epithelium.

He marshals an invincible phalanx of cases, under each class of ovarian adenomata, to show its direct origin from proliferation, invagination and metaplasia of the germinal epithelium of the surface. His work is ably seconded and confirmed by Max Walthard.

Now, I venture to affirm (and hope that my drawings from these cases in a measure prove) the theory first advanced by Dr. Pick, that the ciliated cysts of the ovary are but a special instance of the ability of the pelvic peritoneum to form cilia.

In the case where cysts of all the pelvic peritoneum were an accompaniment of large proliferating ovarian cysts, the little cysts resembled the ovarian cysts in all peculiarities of structure.



Case V. Fig. I.

Now, it seems likely that in this case the same tendency which caused proliferation of the germinal epithelium of the ovary caused the formation of independent cystadenomata of other parts of the pelvic peritoneum. That these cysts of the peritoneum were independently formed, I call to witness my drawings, particularly Figs. 1, 2, 3 and 4, Case V.

They show ingrowths of solid and tube-like projections, and tubes with cystic dilatations on the distal end, and Fig. 4 shows direct gradations of flat to ciliated cylindrical epithelium in the same specimen.

The occurrence of ciliated epithelial cysts from cystic dilatation of the parovarian tubes, from accidental out or onfoldings of the celom epithelium is not affected by these findings.

To summarize in a sentence, then, the remarkable property of the pelvic peritoneum to develop *ciliated* cysts in post-fetal life is nothing more than the specific property of the same present in fetal life, and preserved until maturity under certain circumstances, or possibly reverted to under the influence of appropriate stimulus.

212 Howe Avenue.

THE RELATION OF THE APPENDIX TO PELVIC DISEASE.*

BY
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My interest in the question of the relation of the appendix to pelvic disease has been, in the main, practical. I presume my experience has been quite similar to that of other members of this Society. At first I did not pay any particular attention to the condition of the appendix when the abdomen was opened for other purposes. When the symptoms distinctly pointed to a primary appendicitis, I operated by the lateral incision and removed the appendix. Now and again, when the appendix was connected with a pus tube or pelvic tumor, it was removed if it appeared diseased. Occasionally patients returned after a pelvic operation, complaining of pain and tenderness on the right side, and at a second operation the appendix was found at fault and removed. But I failed to realize the importance of a routine examination of the appendix when the abdomen was opened for some other purpose. When I became convinced of the desirability of this procedure, it was done in every case where the condition of the patient did not prohibit such an examination. The appendix was removed whenever it was adherent or presented any abnormalities in position, size or shape. When the removed appendices were examined microscopically I found that the pathologic findings did not correspond with the appearance of the appendices noted at the time of the operation. For example, I would remove a club-shaped, adherent appendix, thinking it to be diseased. The microscopic examination, on the contrary, would show practically a normal organ. In other words, clinically, I had made a mistake. Again, appendices, apparently perfectly normal, removed solely for the purpose of microscopic examination, were found either diseased or exhibited signs of former inflammation. As a practical sugeon I wished to remove the appendix if it was diseased or the patient would be any better off for its removal. But as far as I could see I could not tell by mere inspection at the time of operation whether the organ was diseased or not. In order to throw some light upon the question, clinical and microscopic observations were made on 200

*Read before the American Gynecological Society, May 25, 1905.

appendices removed after the abdomen had been opened for distinct pelvic disease. I was unfortunately prevented from presenting the results of this investigation before this Society last year. But my paper was printed in full in the Transactions.

I judge, that in a discussion of this kind, the greatest interest is felt in the more practical aspects of the question, so I shall arrange my remarks largely with this end in view. I have recorded in detail certain other observations, which may be found in my paper of last year by those interested in this subject.

I take this opportunity of adding 85 cases to the 200 already reported upon. I have endeavored to make during the past year even more accurate observations than those which formed the basis of my former paper. I shall compare the results obtained in the two series of cases.

Conclusions based upon the clinical and microscopic study of 85 appendices removed during the course of operations for pelvic disease:

1. In the first series of 200 cases a little over 50 per cent. of the appendices were found microscopically to be normal. In the present series 49.3 per cent. or practically 50 per cent. were found normal. The same microscopic classification was adopted as last year, namely:

1. Negative.
2. Chronic inflammation.
3. Doubtful significance.
4. Former inflammation.
5. Acute inflammation.
6. Peri-appendiceal inflammation.

The only change in the classification was that groups 1 and 3 were practically united, and with the exception of two cases were placed in the negative group. This is a minor detail of classification, however, as in each series the appendices in both groups were considered normal.

2. Thus, in both series practically one-half of the removed appendices were microscopically normal, while the remainder showed evidences of acute or chronic inflammation, or the results of former inflammation.

3. The average length of 79 appendices was 9.99 centimeters. In the first series the average length was 8.25 centimeters.

4. The appendix was found adherent in 20 out of the 85 cases. or in 23.4 per cent. This is 5 per cent. higher than in last year's series. But both series show that the appendix is adherent twice

as frequently in those cases where microscopic examination shows past or present disease. A certain proportion of adherent appendices are, however, perfectly normal microscopically.

5. Abnormalities in shape were noted in 27 out of the 85 cases. The appendices were found to be club-shaped, constricted, or bent upon themselves in 10 of these 27 cases, yet, microscopically, such appendices were normal. Hence the same conclusion arrived at last year holds good for the present series. "Mere shape of the appendix cannot serve as an index of its normality or disease. Appendices may be club-shaped, constricted, or bent upon themselves, and yet be perfectly normal."

6. There were fecal concretions noted in 14 out of the 85 cases. This gives a percentage of 16.4, and is double that noted last year. This may be explained by the more accurate observations made in the present series of cases. It does not take into consideration microscopic concretions, but only the palpable forms. In 7, or one-half of the cases, the appendices with fecal concretions were normal, hence, as noted in the first series, "their existence does not denote disease."

7. Exactly 50 per cent. of the 34 patients in the present series with chronic disease of the appendages showed accompanying disease of the appendix.

8. The following conclusion holds good for both series. "In chronic disease of the appendages adhesions of the accompanying appendices are present in nearly 50 per cent. (47 per cent. second series) of the cases where microscopic examination shows the latter to be diseased. In a certain proportion of cases, however, although the appendix may be adherent, it is also perfectly normal.

9. Of the 17 normal appendices accompanying chronic disease of the appendages, 9 were noted as changed in shape, or contained fecal concretions, hence "in chronic disease of the appendages, the appendix which is club-shaped, constricted, or contains fecal concretions, is not necessarily diseased."

10. There were 21 cases of uterine fibromata among the 85 patients. Of these 48 per cent. had accompanying disease or evidence of former disease of the appendix. The percentage was in the first series practically the same.

11. There were 8 cases of large ovarian cystomata in the second series. Of these, 50 per cent. had accompanying disease of the appendix, 20 per cent. less than in the first series.

Thus, with the exception of a few unimportant details, the results of the investigations are identical in the two series of cases.

A great many appendices which *look* diseased are shown microscopically to be normal, and *vice versa*. Then, if we cannot tell by inspection or palpation which appendices are and which are not pathologic, unless we would leave some diseased organs behind, we must remove them all, unless the danger to the patient be greatly enhanced. There are cases where the appendix is so buried in adhesions that its removal will add to the dangers of the operation. But such an appendix is a menace to the future life and comfort of the patient, and should always be removed when the abdomen is open, provided the prolongation of the operation will not produce too profound a shock. This, however, is the exceptional case. In the ordinary case, even where the appendix is slightly adherent or otherwise somewhat difficult of removal, the prolongation of the operation by the removal of the appendix does not add to its dangers to any appreciable degree. A surgeon has to decide in a particular case, when it is inadvisable to remove the appendix also, just as other matters of equal moment have to be decided upon the operating table.

I cannot agree with the dictum that we should not remove the appendix as a routine procedure because we do not as yet know the functions of this organ. It does not belong in the same category with the ovaries, and, in my opinion, never will. The more one sees of appendicitis, acute, subacute, and chronic, the safer he would feel if his appendix adorned the shelves of a laboratory. While he would not elect the operation, he would probably have small compunction in directing the surgeon to remove this troublesome organ if the abdomen were opened for another purpose. At least, I find the majority of my patients have this feeling in the matter, and I must say I agree with them.

I have dwelt at some length upon this one phase of the subject, because it is being so thoroughly discussed at the present time. That there is a direct connection between disease of the pelvis and appendicitis is pretty well acknowledged. To my mind, it has been proved beyond the shadow of a doubt. I have proved it, at least to my own satisfaction, both from a clinical and a microscopic standpoint. Where there is disease enough in the pelvis to call for an abdominal operation, there is every reason to expect that the appendix may be diseased also. Hence, I see no reason for changing the opinion expressed last year.

"Since it is impossible for the surgeon by gross appearances alone to determine which appendix is diseased, and since nearly 50 per cent. of appendices, where the abdomen is opened for other

purposes, are found microscopically to be diseased, it is the surgeon's duty in the absence of contraindications to remove the appendix in every case. Otherwise he will leave behind diseased appendices, which may prove a subsequent source of suffering to the patient."

INFLAMMATORY CONDITIONS OF THE APPENDIX ACCIDENTALLY BROUGHT TO LIGHT IN PELVIC OPERATIONS.*

BY

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Professor of Gynecology, Western Reserve University, Visiting Gynecologist to the Lakeside Hospital,
Cleveland, Ohio.

THE surgery of the appendix affords one of the most interesting fields which the diagnostician or the operator is called upon to study. In the present paper, however, an attempt has been made to deal not with the broad question of appendicitis, but rather with the lesions that are discovered—one might say almost accidentally—when the abdomen has been opened with the expectation of relieving some morbid pelvic condition, more especially one affecting the tubes and ovaries. In a fairly long series of abdominal operations—some 370—I have made it a routine procedure to examine the appendix vermiformis, and where this organ seemed to be diseased and the condition of the patient seemed to warrant the procedure, I have been in the habit of removing it. In the hope that our experience has not been without value, I shall briefly give the salient points which have been gathered from this series of operations.

In the first place the macroscopical appearances are far from being trustworthy in every case. Thus in quite a number of the instances in which, to us at the time of the operation, the appendix appeared to be diseased, microscopical examination failed to show any signs of inflammatory change. On the other hand, in a measure the converse is also true. When we find that the appendix, the tubes, and the ovaries are all diseased, the question arises: In which of these structures did the process begin? Not a few operators are of the opinion that an inflammation in or about the appendix can, and not rarely does, spread to the tubes and

*Read before the American Gynecological Society at Niagara Falls, New York, May 25th, 1905.

ovaries. They hold that in many instances a perforation of the appendix takes place and that the accident leads to an inflammatory involvement of the lateral structures; but that the perforation having healed, the appendix gives no further trouble and at operation looks perfectly normal, while the secondary effects remain. It is hard to believe that such instances are very common, and certainly we are not justified in accepting such a conclusion for any given case unless a microscopical examination has clearly shown that a perforation has at some time taken place. So far as my own experience goes, in over 1,000 abdominal sections for pelvic disorders, I have failed to find positive evidence that in a single case the appendix has been the primary seat of the disease.

In most cases of pelvic peritonitis leading to abscess formation, careful inquiry will elicit a history pointing to an original gonorrhea or to a septic infection following labor or abortion as the starting point of the condition. Again, it is readily seen that an infection which arises from these causes might readily implicate the surrounding structures. This, then, I believe to be the most reasonable explanation in the majority of the pelvic cases in which we find evidence of an old periappendicitis and adhesions. Nor are such conditions rare.

So far as the differential diagnosis between a more or less acute appendicitis and an inflammation of the lateral structures is concerned, the problem, as a rule, is not difficult. If a history of gonorrheal infection or pelvic disturbances following labor or abortion can be elicited, and bimanual examination shows some abnormal enlargement in the region of the adnexa, the morbid condition, or, at least, the predominating lesion, can with safety be decided to exist in the tubes and ovaries.

Whether in all cases in which we find the appendix flexed or firmly bound down by adhesions, we are dealing with a pathological condition which must almost inevitably cause trouble at some future time, is a question that cannot always be answered. It would seem, however, fairly certain that such conditions are not always of special significance. Nevertheless, in these cases I do not see the use of taking any unnecessary chances, and, provided that the patient is in a satisfactory condition, and will not be exposed to any risk by a slight prolongation of the operative procedures, it is my custom to remove the appendix whenever the abdomen is open for other reasons. By adopting this procedure, in the absence of contraindications, I am sure that we have saved many of our patients future trouble, and not a little anxiety.

Of the 370 appendices removed and examined microscopically, 103 were normal, 46 showed signs of a chronic, and 1 of an acute appendicitis. In 88 cases there was a hypertrophy of the subperitoneal or internal coat, or of both coats. In 66 cases the changes were of doubtful significance. In 36 cases the lumen was occluded; in 16 dilated; in 12 contained concretions; in 1 case the appendix was cystic and had undergone myxomatous degeneration; in one case no lymphoid tissue was present.

The following table shows the conditions existing at the time of operation, with the proportion of cases in which inflammatory changes were found in the appendix on microscopical examination:

TABLE.

OTHER CONDITIONS PRESENT.		INFLAMMATORY CHANGES IN APPENDIX.	
Normal tubes and ovaries	136	12 or	8.82 per cent.
Adherent tubes and ovaries	42	2 "	4.76 "
Chronic salpingitis	44	5 "	11.36 "
Tuboovarian abscess	5	0 "	.00 "
Pus tubes	46	7 "	15.22 "
Tubercular salpingitis	8	1 "	12.05 "
Acute salpingitis	3	2 "	66.67 "
Hydrosalpinx	9	1 "	11.11 "
Hematosalpinx	3	1 "	33.33 "
Ectopic gestation	2	0 "	.00 "
Ovarian cyst	9	2 "	22.22 "
Cyst in R. broad ligament (cholesterin)	1	1 "	100.00 "
Parovarian cyst	5	1 "	20.00 "
Mixed conditions	26	8 "	30.77 "
Myomata	10	2 "	20.00 "
Retroversio uteri (adh.)	9	1 "	11.11 "
Descensus uteri (adh.)	7	1 "	14.28 "
Sarcoma uteri	1	0 "	.00 "
R. Perisalpingitis	1	0 "	.00 "
Ventral hernia	3	0 "	.00 "
	370	47	13.46

PUS CASES.

Pyosalpinx	46	7
Tuboovarian abscess	5	0
Mixed conditions	13	4
	64	11 or 17.19 per cent.

	Myomata.	
Alone	10	2
Mixed conditions	8	1
	18	3 or 16.66 per cent.

A few points of interest may be noted in connection with certain groups in this table. The total number of cases which showed inflammation of the appendix is 47; 12 of these were found in conjunction with a normal tube and ovary, and the morbid condition for which operative procedures were instituted were various—retrodisplacements of the uterus with or without adhesions, resections of graafian follicles, puncture of graafian cysts, etc. In 42 cases adherent tubes and ovaries were met with, and in this group there were 2 cases of inflammation of the appendix. In 64 pus cases in 11 (about 17 per cent.) there was an appendicitis. In 148 cases showing inflammatory conditions affecting the tubes and ovaries; in 25 (16.89 per cent.) there was an appendicitis; in 9 cases of ovarian cystoma there were two cases of appendicitis; in 5 cases of parovarian cyst 1 case of appendicitis; 1 case of cyst (cholesterin) of the right broad ligament showed also an appendicitis. Thus in 15 cases of cystic growths, appendicitis was also present in 4 (26.66 per cent.). It is also interesting to note that in 18 cases in which the uterus was removed for myoma, the appendix showed inflammatory changes only in 3 cases (16.66 per cent.).

Deaths.—In making up such an analysis it is of interest to determine, if possible, whether or not the removal of the appendix could in any way have been concerned in causing the fatal result. In this particular analysis, at any rate, we can fairly assume that the removal of the appendix played no part in producing the deaths. We had four deaths in 370 cases, or a mortality of a little over 1 per cent. for the total number of cases.

Case I.—Both tubes, and ovaries, and uterus were removed on account of a myomatous tumor, with a right hydrosalpinx and an adherent ovary, also a left chronic salpingitis with an adherent ovary and occluded appendix. The patient died on the fifth day from a septic peritonitis.

Case II.—Removal of a cyst of the broad ligament, which was adherent to the intestines, tubes and ovaries. The appendix showed chronic inflammatory changes. The patient was in good condition until the fourth day, when pain from distention was treated by a turpentine enema, which was later found in the peri-

toneal cavity. In all probability the bowel had unwittingly been torn during the separation of the adhesions.

CASE III.—An adherent right ectopic gestation with adherent left tube and ovary, and hypertrophy of the coats of the appendix. Double salpingo-oophorectomy. The patient developed an ileus on the eleventh day due to adhesions. The abdomen was reopened. The patient died from shock two hours following the operation.

CASE IV.—Removal of adherent left tube and ovary, with separation of adhesions binding down the uterus. Death on the seventh day as the result of a streptococcus peritonitis. The appendix showed chronic inflammatory changes.

CONCLUSIONS.

1. In a large number—in our series in 323 out of 370—of pelvic cases no inflammatory changes in the appendix are found even microscopically.

2. When we find a normal appendix in conjunction with disease of the pelvic organs, it is improbable that the latter condition has been brought about by a perforation of the appendix which had afterwards healed.

3. On the other hand, an old periappendicitis and adhesions may often be looked upon as the result of a septic infection, originating in and spreading from the organs of generation.

4. An appendix which looks abnormal macroscopically does not always show inflammatory changes on microscopical examination.

Nevertheless, (5) when the removal of the appendix adds very little to the gravity of the abdominal operation, for the benefit of the patient, it should be taken away.

6. In our our series of 370 cases there were 4 deaths, but a careful analysis goes to show that the fatality could in no instance be attributed to the removal of the appendix.

702 ROSE BUILDING.

APPENDICITIS IN RELATION TO PELVIC DISEASE AND PREGNANCY.

BY

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Montreal, Canada.

THAT no machine is stronger than its weakest part is an axiom in mechanics which may be accepted without argument. Although our beloved and esteemed Oliver Wendell Holmes described a machine which was so well constructed that it had no weakest part and which all went to pieces at once, that was a poetic fancy; for as a matter of fact the axiom is true, and were it not for some weak link which breaks first, every chain would hold forever. The human body is the most complicated piece of machinery which has ever been constructed, but unlike machines of wood or metal, the more it is used the stronger it becomes, and were every part used as nature intended that it should be, there would be no weakest part, and it would go on working for a much longer time than it does. But owing to changes from the natural to the artificial modes of life, there are some parts of it less used than others, and these parts become the weakest ones. Although we have fallen into the erroneous habit of speaking of work as being the cause of disease, we will generally find on closer analysis that it is really the idleness of an organ that kills it. If we walk on our own legs they become stronger, but if we hire another man to carry us, his legs become stronger and ours become weaker. If we masticate our own food from childhood up to old age our jaws will be big enough to hold the natural number of teeth and the latter will be sound; but if we have our food masticated for us by the miller or the cook, or if we swallow it without mastication at all, our jaws will fail to grow big enough to hold the natural number of teeth, and the latter will either be crowded out or else they will decay from the attacks of bacteria, against which they are defenceless, because of their poor circulation and defective phagocytosis. Many other instances could be given which go to prove that no greater misfortune can befall an organ than the failure to use it. Since we pay

policemen or soldiers to watch for our enemies we have lost the use of the external muscles of the ear, and in many women the muscles of the abdomen, of the pelvis and the round muscles of the uterus have almost disappeared. Even the bones are getting fewer, as, for instance, the phalanges of the little toe, which have come down to two and in some people to one, because we wear tight boots and do not use the little toe. Owing to our present methods of living the vermiform appendix is the least used part of the human mechanism. From our knowledge of comparative anatomy we may safely conclude that at one period of man's history the appendix of the cæcum was such an important organ that the human being who had one the least bit shorter than his neighbor's had a slightly lesser chance of surviving in the struggle for existence. At a time when one had to consume enormous quantities of coarse roots and leaves, which was the only food to be had at certain seasons of the year, the man who was a few quarts short of appendical juice was soon left behind in the struggle, and he had fewer children to inherit his appendical shortcoming; while the one who had an extra long one flourished accordingly and handed down to a numerous progeny his appendical advantage. Just as they now say that an army crawls on its stomach, there may have been a time in man's evolution when his success in life depended upon the length of his appendix. Now all this has been changed; our ancestors by picking out the roots which were most easily digested, and by storing up nuts and other wild fruits to last them through the winter, were able to get along very well with a few inches less of appendix. When they took to eating meat and other foods which were digested in the stomach, the appendix became a few inches shorter; and as the art of cooking advanced so that their food was almost entirely digested before it reached the cæcum, the *raison d'être* of the appendix ceased to exist. So that at the present time, Sir William McEwen's high opinion to the contrary notwithstanding, it is not only of no advantage to have a long appendix, but, on the contrary, it is a handicap and source of danger to have one at all. Indeed, it is quite conceivable that with a great increase in the use of pepsin and predigested foods it may only be a question of a few thousand years for the cæcum itself to follow the five-foot appendix into the historic realms of things which have been. This view of the case renders it easy to understand why appendicitis is so much more frequent now than it was a hundred years ago. For not only are many cases recognized as appendicitis now which would have been diagnosed as

something else a century ago, but after allowing for the defective pathology and diagnosis of those times permitting many cases to escape detection, there is not the slightest doubt that appendicitis is ever so much more frequent at the present time. It is also easy to understand why it will be a great deal more common in the future. As an illustration let us suppose that a thousand machines were ordered for a cotton factory and that they were all set going at precisely the same moment and kept going without any repairs until they broke down; and supposing that in each of these thousand machines a certain rod was the weakest part. All of these thousand machines might go on without one breaking down during the first thousand hours, but if at the end of that time one of those rods should break, this would correspond with the first case of appendicitis three or four thousand years ago. During the next thousand hours two or three more machines would probably break down owing to the wearing out of that weakest rod. During the third thousand hours the number breaking down would be very much greater and so on with each succeeding thousand hours until during the last thousand hours of the life of those machines the best hundred would all break down within a few hours of each other. This would correspond with the period in the evolution of the appendix when people will be born with an appendix so short and so weak that it will be the exception for any one not to have appendicitis, just as it was at one time the exception for any one to have the disease.

We may safely say that there is no organ in the body not even excepting the coccyx, which is less used than the vermiform appendix is to-day and being the least used it is by long odds the weakest. It also seems to me that it is nearing the end of its evolutionary life and that it is doomed to disappear within the next few generations. Although the rise and fall of the appendix in the human race is an interesting study, my observation of its diseases and complications have been mostly made on women, among certain strata of which sex it is much more common than in others. And this also is easy to understand; for an organ which is weak, even in the healthiest, must be still weaker in the unhealthy. And who are the unhealthy? Certainly those who are deprived of fresh air, sunshine, proper food and exercise. Here we have the explanation of the well-worn joke that it is fashionable to have appendicitis because most of the wealthy people have had it; and it also refutes the unjust accusation which we so often hear that appendicitis was invented by the doctors in order to reap a harvest of opera-

tion fees. The reason why the rich woman in the city is more liable to appendicitis than her poorer sister in the country is because she is the most unhealthy specimen of her race, for the simple reason that she habitually gets the smallest amount of fresh air, sunshine, proper food and exercise. Anyone who knows her mode of life must admit this; losing several hours of sunlight while she is sleeping late in the morning; several hours more while driving about in a closed carriage to darkened stores; and all the rest of the sunlight while attending lunches and card parties in darkened rooms from two until six in the afternoon. As for air, what with the doors and windows of her bedroom closed, what with the overcrowded condition of the badly ventilated shops and the still worse ventilation of the lunch and card rooms during the afternoons and the dining room and theater in the evening, who can get less than she does?

As for food, many of the items on her bill of fare are lacking in the proper elements, and even if the exhausted woman had the right kind of food, she could not digest it, and hence another source of weakness. It is true that the poor woman in the slums of the city also suffers from want of sunlight, air and proper food, and to this extent she is no better off, as regards appendicitis, than her richer sister. But when it comes to the question of lack of muscular exercise, the city woman of the wealthy class, as a rule, suffers most of all. The muscles of the arms, legs, and abdominal walls, all have their work done for them by paid substitutes, while the exercise of the heart and lungs is reduced to a minimum. In this respect, the hard working woman among the poorer classes has a great advantage over the rich, while the farmer's wife and daughter in the country has a great advantage over them both. Also, I think that it has been the experience of most of the abdominal surgeons that this latter class has given us the fewest cases of appendicitis. But if most city women are unhealthy before marriage, what must they be after marriage, when they become either infected or pregnant, or in some cases, both She then becomes one of the weakest specimens of her race. Is it not evident that if any one is a suitable subject for the decay of her least used organ, she is that one. There are many thousands of such women in whom the vermiform appendix is the weakest link in an already weak chain, and they would all do well to have that useless organ removed before they embark on the perils of pelvic disease or pregnancy. For in all of them the appendix is on the verge of decay and only waiting for a temporary increase

in the number of colon bacilli for it to be attacked with ulceration, perforation and gangrene. When the heavy and badly nourished appendix drops down into the pelvis and touches the infected tube, the adhesions are formed which we so often find attached to the latter when we are operating for its removel. During pregnancy digestion which may have been outraged for years breaks down completely and then the appendix becomes worse nourished than ever. Peristalsis is inverted; there is vomiting and obstinate constipation, a condition in which, by actual experiment, the number of colon bacilli is enormously increased. Their function in the economy is to disintegrate dead or dying organic material; if they are not too numerous, and if they remain in the intestine, they do no harm; but when the latter or any part of it becomes weakened, the colon bacilli migrate into its walls and cause ulceration. If the circulation of the patient is bad and the quality of the circulating fluid is poor, there is nothing to prevent the ulceration from going on to gangrene and perforation, with general infection of the peritoneal cavity. If, on the contrary, the quantity and quality of the circulation is fairly good, phagocytosis takes place, and the weakened appendix is strengthened and walled off by adhesions, consisting of organized lymph and omentum, and the general peritoneal cavity is saved.

Considering how near the appendix is to the pelvic organs, and how often it is affected by the same causes which affect them, such as constipation, poor circulation, etc., and remembering that an infected appendix may dip into the pelvis, and infect a congested or inflamed Fallopian tube, even of the left side; and, in view of the lesser resistance of the economy in general, and of the appendix in particular during pregnancy, under modern conditions, the writer believes that many cases of supposed pelvic disease and puerperal septicemia are due to diseases of the appendix. In the case of the Fallopian tubes I am sure of it, for in more than a dozen cases when I have been operating for removal of pelvic abscess, I have found the right tube, and in one case, the left tube, with the appendix imbedded in the adhesions.

I have had no death in my midwifery practice for the last twenty years, and, although before that time I had two or three deaths from general peritonitis, we did not know enough about the appendix in those days to even suspect that it mikht have had something to do with the condition. But the literature contains many authentic cases of appendicitis during pregnancy, and when I look back on my experience of many pregnant women who complained of pain

in the right side, I am convinced that many of them were suffering from mild appendicitis, or from the dragging upon adhesions of the appendix to the right tube, or to the uterus, or to the wall of the pelvis. If this point were especially looked into by those who have an opportunity of making postmortems, on women dying during the last week of pregnancy, much light would be thrown upon the subject of those severe but ill-defined pains which so many pregnant women complained of in their right side.

As all our studies and deliberations lead up to the one great end, namely that we may give our patients better preventive and curative treatment, let us inquire what should be our treatment in these cases so that we may the better relieve suffering and save life.

Perhaps in no department of medicine has greater progress been made during the last twenty-five years than in the treatment of pelvic diseases, and in the care of the pregnant woman. Previous to that time the removal of pus tubes, tubal pregnancies, and of tumors of the uterus and ovaries, while they were yet small enough to remain in the pelvis, was very rare. At that time it was no uncommon thing to see a woman with a pelvic abscess which was allowed to burst into the bladder, rectum, or vagina, and even through the abdominal wall, die from prolonged and exhausting suppuration. At that time, too, it was the exception to give the pregnant woman any treatment whatever until she sent for her own or any casual physician to attend her in her confinement. In both of these respects a great improvement has taken place. Pus tubes are now recognized, if not before irreparable damage has been done by the protective adhesions thrown out by nature, at least before disastrous rupture has taken place into other cavities. While the pregnant woman is receiving more and more attention earlier and earlier in her pregnancy in order to prevent as well as to remedy the ills which modern methods of living are bringing upon her, there yet remains, however, much to be done, and in no direction more so than in the direction which forms the subject of this discussion.

So that, with all due conservatism, the writer feels convinced that in all operations for pelvic disease the vermiform appendix should be suspected, examined, and, if found guilty, removed. And women who are known to have appendicitis should be urged to have it removed before marriage, or at the latest before the third month of pregnancy, if it causes trouble. While the writer does not wish to go quite so far as that, still he thinks that it is a

question worthy of discussion whether it would not be better to remove the appendix at a time when there would be no death rate, from those women who are almost certain to require its removal sooner or later, and in whom a late operation gives such a high mortality.

If the above data are correct, and, of course, they are open to criticism and correction, we know fairly well the kind of women who are almost certain to be attacked with appendicitis, and in them, at least, an ounce of prevention is worth a pound of cure.

248 Bishop Street.

REASONS FOR REMOVING THE VERMIFORM APPENDIX IN NEARLY ALL CASES WHERE THE ABDOMEN IS OPENED FOR OTHER LESIONS.*

BY

W. A. BAKER, M.D.,

Boston, Mass.

When Dr. Kelly, a little more than two years ago, published the answers he had received from the profession to the question, "When the abdomen is opened for other causes and the perfectly normal appendix is easily accessible, is it your rule to remove it?" I was somewhat surprised to find myself among the minority in the affirmative. Still, so firmly convinced was I of the wisdom of such a procedure that I have continued to follow the rule, and find that as time goes on I search for and remove the appendix even where it is not so easily accessible. Also, I now find myself taking the necessary four or five minutes for the appendectomy, even at the end of the time required for three or four other abdominal operations.

In order to additionally prove to my own mind the correctness of this rule, I have had the last twenty-four cases of abdominal section in my private hospital and in the Free Hospital for Women in Brookline tabulated and a careful macroscopical and microscopical examination made, with the following results:

In the twenty-four cases, four occurred (and all of these were in my private hospital) where the appendix was not even looked at, so low was the condition of the patient when the operation for which the abdomen was primarily opened was completed. In all

*Read before the Woman's Hospital Society, March 28, 1905.

twenty-four cases the recovery was uneventful, and I could see no difference in their progress, whether appendectomy had been performed or not. Thus we have twenty cases where the abdomen was opened for other causes and appendectomy was done before closing the abdomen. In only one of these cases (Case IX) were the rational signs of appendicitis present, neither did the history of the case point to attacks of the disease. In none were the gross appearances, from casual examination at the time of the operation, characteristic of appendicitis, it being unnecessary to separate any adhesions of the appendix to surrounding parts; neither exudation or lymph, nor dense cicatrices existed. In fact, all would pass, from such casual examination, for normal appendices. All appendectomies were performed through the median incision, sometimes very small, as in cases of ventro-suspension or resection of the ovary, and in no case was it necessary to enlarge the first incision in order to perform the operation on the appendix.

Case I.—Mrs. H., Abscess of abdominal wall. Operation: Removal of the same and appendectomy.

Pathological Examination.—Appendix 5½ cm. in length, average width 7 mm. Some adipose tissue attached to site of mesoappendix. Lumen large throughout entire length and filled with feces. Section taken from proximal end.

Microscopic Examination.—Appendix, normal mucosa, partly eroded either by fecal contents or by mounting. Submucosa and muscular layers normal. Slight thickening of peritoneal covering in places.

Diagnosis.—Normal appendix.

Case II.—Mrs. K., salpingo-ovaritis. Operation: Left Salpingo-oophorectomy and vaginopexy.

Pathological Examination.—Appendix 6 cm. in length, average diameter 1 cm., covered with adhesions. On incision: wall thin, lumen large and filled with feces; at distal end of lumen small scybalum.

Microscopic Examination.—Appendix, lumen dilated, with corresponding thinness of appendicular wall. Some excess of leucocytes in the mucosa. Serosa is thickened and edematous. Blood vessels much dilated and injected, and containing many leucocytes, many of them in the process of diapedesis.

Diagnosis.—Dilation of the appendix with periappendicitis.

Case III.—Mrs. S., Bilateral salpingo-ovaritis. Operation: Resection of ovaries, hysteropexy and appendectomy.

Pathological Examination.—Appendix 4 cm. in length, average

width 1 cm.; vessels congested and few adhesions on surface; both ends patulous, with constriction in center, small amount of feces in proximal end.

Microscopic Examination.—Wall very much thickened in all its layers. Only a slight trace of the lumen. Mucosa entirely disappeared, its place being occupied by a newly formed connective tissue. The surface of the peritoneal layer is thickened and shows some fine adhesions. The blood vessels of the surface are congested and the entire peri-appendix is thickly infiltrated with polynuclear leucocytes.

Diagnosis.—Chronic obliterative appendicitis with subacute peri-appendicitis.

Case IV.—Mrs. C., myoma of uterus. Operation: Hysterectomy and appendectomy.

Pathological Examination.—Appendix has normal appearance and is 3 inches long, average width 6 mm. Lumen is patulous throughout and contains a bloody mucous material.

Microscopic Examination.—Muscular layers normal in thickness. Submucous connective tissue layer thickened and densely cicatricial. Mucosa shows some normal glands, but is everywhere eroded. The glands contain polynuclear leucocytes. Adenoid tissue diminished. Beneath the entire periphery there is an infiltration of polynuclear leucocytes.

Diagnosis.—Chronic appendicitis.

Case V.—Mrs. F., multiple myomata of uterus. Operation: Hysterectomy and appendectomy.

Pathological Examination.—Appendix 8 cm. in length, with point of constriction near center and dilated portion at distal end.

Microscopic Examination.—Dilated portion: Muscular layer much thinned out, the circular fibers having in places almost completely disappeared. The adenoid tissue is very much and uniformly increased at the expense of all the other layers. The mucosa is flattened out and shows only a few glands. Polynuclear leucocytes can be seen both in the periphery and in the mucosa. Constricted portion: Shows much the same appearance, the constriction being due to the increase in adenoid tissue and the dense layer of fibrous submucous tissue. Peritoneal layer is also much thicker and contains characteristic evidences of inflammation.

Diagnosis.—Chronic appendicitis.

Case VI.—Mrs. W., multiple myomata. Operation: Hysterectomy.

Pathological Examination.—Appendix 2¾ inches long, average

width 4 mm. Lumen very much dilated throughout and wall very thin. Lumen filled with dirty granular material.

Microscopical Examination.—Lumen greatly dilated. Wall much thinned at the expense of the muscular layers. Mucosa thin, flattened and infiltrated with blood and leucocytes. Submucosa abnormally thick and cicatricial.

Diagnosis.—Chronic appendicitis.

CASE VII.—Miss B., retroversion with adhesions. Operation: Hysteropexy, appendectomy.

Pathological Examination.—Appendix 6 cm. in length by 1 2-5 cm. in width. Lumen large and contains a dirty, bluish, semi-solid material. Lumen is almost obliterated and the wall throughout is very thin.

Microscopic Examination.—Lumen greatly dilated and the wall of the appendix thinned. A few flattened mucous glands may be seen. The surface is covered with a nearly uniform layer of organized fibrin, in which are scattered polynuclear leucocytes and round cells.

Diagnosis.—Chronic appendicitis.

CASE VIII.—Mrs. J., right salpingo-ovaritis. Operation: Right salpingo-oophorectomy, appendectomy.

Pathological Examination.—Appendix 5¾ cm. long, ¾cm. wide, slightly curved and twisted. Appears to have constriction 1½ cm. from distal extremity. Has a fluctuating feeling, as if it contained fluid. Lumen of appendix was enlarged and filled with coffee ground material. The wall very thin.

Microscopic Examination.—Lumen much dilated at the expense of all layers of the appendicular wall. All the vessels are intensely injected and in the musosa and submucosa there is a general cellular infiltration of blood. There are to be found no signs of an active inflammatory process.

Diagnosis.—Chronic dilatation with passive congestion.

*CASE IX.—Miss S., retroversion. Operation: Hysteropexy, appendectomy.

Pathological Examination.—Appendix 5½ cm. long and 5 mm. in width. Lumen not obliterated at any point.

Microscopic Examination.—Mucous layer is thickened and there is considerable increase in adenoid tissue. Mucosa is greatly infiltrated with polynuclear leucocytes, especially of the eosino-

*This patient had a mild attack of appendicitis ten days before operation, but entered the hospital for pelvic trouble.

philic variety. The surface vessels are injected and contain leucocytes in the act of diapedesis.

Diagnosis.—Subacute catarrhal appendicitis.

CASE X.—Miss Y., endometritis, abnormal shortening of the lumbo-ovarian ligament, with undeveloped right kidney. Operation: Curettage, right nephrectomy, appendectomy.

Pathological Examination.—Appendix 6 cm. in length, 5 mm. in diameter. Appears generally shrunken, but has a slight dilatation at its tip. The walls are somewhat thick, the lumen small, and this is especially emphasized in the slightly enlarged tip. No exudate is present in the lumen and there are no foreign bodies. A considerable amount of fat is present in the meso-appendix.

Microscopic Examination.—Mucosa normal in appearance, but there is considerable excess of leucocytes, especially of the eosinophilic type. Submucosa thickened and edematous with numerous newly formed blood vessels which are injected. Serosa thickened and shows fine adhesions. The peripheral vessels are much injected and show leucocytes in diapedesis.

Diagnosis.—Mild chronic appendicitis, with peri-appendicitis.

CASE XI.—Mrs. L., cyst of right broad ligament and cystic degeneration of left ovary. Operation: Removal of both, through abdominal incision, appendectomy.

Pathological Examination.—Appendix 7 cm. in length by 1½ cm. in diameter, club-shaped, with peritoneal vessels injected; walls moderately thick, lumen dilated to 1 cm. and filled with purulent exudate that microscopically consists of leucocytes and cholesterin crystals.

Microscopic Examination.—Sections from the appendix show that the mucosa is flattened and bathed with polymorphonuclear leucocytes and serum. A few leucocytes and small round cells are generally infiltrated through the submucosa. The muscularis has a normal appearance. The peritoneum is thickened and the vessels dilated and filled with polymorphonuclears, and there is a general extravasation of polymorphonuclears and round cells through the layer.

Diagnosis.—Purulent appendicitis.

CASE XII.—Mrs. E., myoma of uterus. Operation: Supravaginal hysterectomy and oophorectomy, appendectomy.

Pathological Examination.—Thickened appendix hardened and resilient. Lumen in peripheal half is surrounded by a thick band of cicatricial tissue. Whole appendix 2½ cm. long after hardening.

Microscopic Examination.—Mucosa normal, with a small lumen. Submucous tissue consists of a thick band of cicatricial tissue. Adenoid tissue is for the most part absent. There are several congested blood vessels in the periphery containing leucocytes in the act of diapedesis.

Diagnosis.—Slight peri-appendicitis.

CASE XIII.—Mrs. E., retroversion with adhesions. Operation: Hysteropexy and resection of both ovaries, appendectomy.

Pathological Examination.—Appendix 6½ cm. long, 6 m. in diameter, having cicatricial construction at proximal end and the remaining portion of appendix dilated and partially filled with fecal matter. The walls of appendix are indurated. Over the surface of the appendix the vessels are injected, but no adhesions are apparent. The tip of the appendix is somewhat more dilated than the intermediate portion. In the meso-appendix there is present about the usual amount of fat.

Microscopic Examination.—The vessels of the peritoneal layer of the appendix are engorged with blood in which is an excess of leucocytes, and these may be seen in most cases to be passing through the vessel walls, and are somewhat diffused through the serosa. There is some thickening of the submucosa with old fibrous tissue. A small amount of fecal material is present in the lumen of the appendix. Sections taken through the tip show the same condition, but a greater dilatation of the lumen.

Diagnosis.—Chronic appendicitis, with peri-appendicitis.

CASE XIV.—Miss B., myoma of uterus. Operation: Myomectomy, curettage through the uterine wound and hysteropexy, appendectomy.

Pathological Examination.—Appendix 6 cm. long, 7 mm. wide. The distal end of meso-appendix still remains attached and is composed principally of adipose tissue. On incision the lumen is found filled with feces, and about 5 mm. in diameter, gradually becoming smaller toward tip, where it becomes almost obliterated. Section taken from middle of appendix.

Microscopic Examination.—Appendix widely dilated and most of the mucous membrane has disappeared. The lymphoid tissue is apparently increased. The connective tissue lying beneath the lymphoid tissue is much thickened and of a cicatricial character, representing a process of somewhat long standing. A few glands can be seen, and between these is an infiltration of leucocytes, many of these of the eosinophilic type. The peritoneal layer is much thinned and crinkled, resembling elastic tissue. Between

the peritoneal layer there is a moderate infiltration of leucocytes. The blood vessels are engorged and show diapedesis.

Diagnosis.—Chronic appendicitis.

CASE XV.—Miss J., multiple myoma of uterus. Operation: Hysterectomy, oophorectomy, appendectomy.

Pathological Examination.—Appendix shows dilatation at proximal end, where it is filled with feces. The very tip end is obliterated. Section through thinned out dilated wall.

Microscopic Examination.—Shows wall of appendix to be greatly thinned, the mucous membrane having completely disappeared in places. Submucous tissue shows only occasional patch of lymphoid tissue. Muscular tissue also thinned out. On the surface of the appendix are numerous old fibrous adhesions. There are no signs of active inflammation.

Diagnosis.—Chronic appendicitis (healed).

CASE XVI.—Mrs. E., retroversion with adhesions. Operation: Hysteropexy, appendectomy.

**Pathological Examination.*—Appendix 5.5 cm. long and 5 mm. in diameter for the greater part, slightly thicker at the tip. It was covered with smooth peritoneum in which were a few small dilated vessels. On one side a small portion of the mesentery, which extended to the tip of the organ, was attached. On section the walls were normal except the submucous, which was slightly thickened, but not more so than is often seen in the normal organ. The mucosa was also normal and showed no ulcerated areas. The lumen contained a small amount of blood clot and soft fecal material.

Microscopic Examination:—A section from near the base of the organ showed the muscular and serous coats normal. The submucous was replaced by a mass of lymphadenoid tissue extending completely around the lumen. This layer was thicker in some places than in others, throwing the mucosa into longitudinal folds. The mucosa appeared normal. A section from near the tip of the appendix showed the same condition with the exception that there was rather less adenoid tissue. Although the sections showed a large amount of small round cell tissue, it was not more than is often seen in the normal appendix.

Diagnosis.—Normal appendix.

CASE XVII.—Mrs. P., retrocession. Operation: Division of the uterosacral ligaments, hysteropexy, appendectomy.

Pathological Examination.—Appendix 6 cm. long and 3 mm.

*Pathological Examination by Dr. C. C. Simmons.

average diameter. Hard and shrunken from drying. Section taken from near middle.

Microscopic Examination.—Appendix very much thickened, wrinkled and dried so that is is impossible to make out a definite diagnosis. It can, however, be said that there is no acute inflammation and that there exists probably a very mild grade of chronic inflammation.

CASE XVIII.—Mrs. N., myoma of the uterus. Operation: Hystero-salpingo-oophorectomy, appendectomy.

Pathological Examination.—Appendix small and shriveled.

Microscopic Examination.—Appendix extremely small and the lumen completely obliterated with cicatricial tissue. The walls consist only of an atrophied muscular coat.

Diagnosis.—Complete involution of the appendix.

CASE XIX.—Mrs. C., endometritis and retroversion with adhesions.

Operation: Curettage and hysteropexy, appendectomy.

Pathological Examination.—Appendix 6 cm. long; normal appearance. Vessels of serosa slightly injected. Proximal end is slightly dilated and fusiform, and on section at this point lumen is found to be rather small and triangular, thick-walled and having contents of about the appearance and consistency of fat. More distally the lumen becomes smaller and contents more fecal in appearance.

Microscopic Examination.—Coats of appendix all appear normal and there is no cellular infiltration. Blood vessels of the serosa are not filled with blood.

Diagnosis.—Normal appendix.

CASE XX.—Mrs. W., endometritis, lacerated cervix and perineum, cystic disease of the ovary and retroversion with adhesions. Operation: Curettage, trachelorrhaphy, perineorrhaphy, resection of left ovary, hysteropexy, appendectomy.

Pathological Examination.—Normal looking appendix, with some injection of peritoneal vessels 4½ cm. by 6 mm. Wall thick and lumen small. Contains no exudate and no foreign bodies.

Microscopic Examination.—Sections appear normal, with the exception that the lymphoid tissue semes to be rather increased in amount, infiltrating the submucosa.

Diagnosis.—Normal appendix.

As a summary of these cases I would present the following:

First: The presence of adhesions of, or fecal concretions with-

in, the appendix are not the only evidences of appendicitis which should influence the surgeon for its removal.

Second: The appearance of the normal appendix at the time of the operation has proved to be unreliable, as three-fifths of the cases reported were suffering from chronic appendicitis.

Third: The advantages to be derived as a prophylactic measure for the removal of the appendix even in cases which prove normal far outweigh the slight additional risk incurred by the operation.

Fourth: The great frequency with which appendicular troubles present themselves warrant not only the removal of the appendix, where it is easily accessible, when performing abdominal section for other lesions, but also the careful searching for and removal of it even though it may appear normal from its gross appearance.

In closing, I would express my great indebtedness to Dr. W. P. Graves for the pathological work which he did in these cases, upon which depends the weight of proof of the reasons enumerated.

22 Mt. Vernon Avenue.

CORRESPONDENCE.

FIBROIDS IN WOMEN UNDER THIRTY.

To the Editor of the American Journal of Obstetrics:

Dear Sir—In my experience fibroids in women under thirty are not at all uncommon. I have at least twice known patients with fibroids to become pregnant before they were thirty; the uterus was removed by Cesarean hysterectomy. Gusserow, "Die Neubildungen des Uterus," gives 165 cases under thirty years of age out of a total of 953 fibroids, and Winckel gives 107 out of 527. Fibroids are, however, rare in women under 25 years of age. I published two cases and an epitome of all the others I could find recorded (40 in all) in the Obstetrical Society of London's *Transactions*, Vol. XL. (p. 1595), to which I would refer Dr. Lucy Waite, as she says she has not been able to find anything on the subject in recent literature. I remain, Yours faithfully,

Herbert A. Spencer, M.D.

London, 104 Hasley St., W.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.*

NIAGARA FALLS, MAY 25, 26 AND 27, 1905.

The President, EMELIUS C. DUDLEY, M.D., *in the Chair.*

POST-OPERATIVE VOMITING.

DR. EUGENE BOISE of Chicago read this paper. There was a vomiting center from which all impulses toward vomiting were sent and they might be received through various channels. The conditions which lead to post-operative vomiting might be grouped as follows: Those pertaining to the anesthetic, those pertaining to to the general condition and surroundings of the patient, and those pertaining to the stomach. The anesthetic caused vomiting, by its direct irritant action on the vomiting center, by causing a toxemia, and by saturating the secretions of the stomach. The conditions pertaining to the stomach were, chronic, such as atony, dilation, chronic disease of the mucous membrane, etc.; acute, as saturation of the tissues and secretions of the stomach by the anesthetic. Treatment must be preventive as well as curative, involving greater care of the patient's preparation. Four things should be kept in mind, viz.: (1) the abnormal irritability of the vomiting center; (2) the condition of the stomach; (3) the condition of the blood, and (4) the condition of the elimination. It was necessary to attempt to obtund the sensitiveness of the vomiting center, neutralize, if possible, the irritant character of the anesthetic, cleanse and soothe the stomach, keep the patient quiet in order to avoid circulatory disturbances, aid elimination, support the patient and nourish the irritated nerve centers by rectal feeding when indicated.

He said that when the patient was profoundly narcotized by the anæsthetic he did not vomit, though he might vomit, and often did, just before profound anesthesia and again when recovering from the anesthetic. This was not because of the condition of the stomach, but because of the direct action of the anesthetic on the vomiting center. It was, therefore, a natural inference that if we could find some remedy that would obtund the sensibility of this center until the anesthetic was eliminated we would have a remedy that would tend to remove one factor that tended to cause vomiting. In those cases where the vomiting did not occur till the introduction of something into the stomach, a free secretion into that organ, it was a natural inference that the vomiting was induced by the irritating character of the secretions and their irritating action on the superficial sensitive nerves of the stomach. In those cases no remedy was equal to gastric lavage. It removed the

*Continued from page 136.

secretions laden with the anesthetic and the toxins, and, at the same time, was soothing to the gastric nerves. To aid elimination rectal infusions of *hot* salt solutions were to be used. When so employed as to bathe the transverse colon they had a very favorable action. They not only washed the blood but promoted elimination by equalizing the circulation by the effect of the heat upon the solar plexus and the splanchnic system. Several remedies for post-operative vomiting had been suggested. The inhalation of vinegar begun immediately after the end of the anesthetic and continued until it had been largely eliminated had been recommended. It was said to act chemically on the anæsthetic, neutralizing its irritating character. To be effective, it must be faithfully and continuously used. The administration of large doses of chloretone just before giving the anesthetic was also recommended. It was supposed to have a soothing effect on the mucous membrane and nerves of the stomach as well as on the vomiting center. Lavage was largely used. It might be instituted immediately after the operation. General nutrition by enemata was often essential in debilitated cases. No specific could be given. All cases should be studied and treated according to the conditions.

Dr. A. Lapthorn Smith of Montreal emphasized the necessity and importance of preliminary preparation of the patient. He supposed that all the members had been annoyed by physicians bringing them cases on the morning train and expecting them to operate within the next hour or so without any preliminary preparation, and anyone who had consented to do that must have noticed the immense amount of trouble he had had afterwards. Careful attention should be given these patients in the way of diet, getting the bowels thoroughly cleansed, so as to bring the amount of vomiting down after operation to the minimum. He had been using small doses of calomel for the last two or three years, and it was effective in one-tenth of a grain dose given every half hour. With regard to vinegar or acetic acid, he was not sure that this had had any beneficial effect. Large quantities of hot water to wash out the ether that had been swallowed during its administration had been advocated. This really amounted to gastric lavage.

Dr. Matthew D. Mann of Buffalo spoke of the character of the anesthetic and said that in some patients the ether produced more vomiting than chloroform. He did not believe the character of the anesthetic had so much to do with vomiting as the amount of the anesthetic used. The more deeply a patient was under the influence the greater the amount of the anesthetic used, and the longer time it took the patient to get rid of it, the more the center which presided over vomiting was irritated. He had been using ether for three years, preceding it by chloride of ethyl, and invariably could put a patient under its influence in two minutes, and then the amount of ether taken for any operation of an hour's duration would be much less than he had formerly used. For instance, he had performed an operation lasting forty-five minutes with two or three ounces of ether. For a long time it was neces-

sary to use more. The giving of chloride of ethyl as a preliminary, followed by small quantities of ether, keeping the patient quiet, had resulted in much less vomiting, and, in many instances, the patients had escaped vomiting entirely. If the members of the Society had not tried this combination, he assured them that it would pay them to consider it. Before he had used chloride of ethyl as a preliminary anesthetic, he employed nitrous oxide, but this was so very difficult to manage, it was so hard to carry around, that it resulted in being largely a nuisance; therefore, he had substituted ethyl chloride for the nitrous oxide, and since then he had been much pleased with it, because the amount of vomiting had been much less.

Dr. A. Palmer Dudley of New York considered the nervous side of post-operative vomiting and urged the necessity of careful preparation before the employment of any form of anesthetic.

Dr. Andrew F. Currier of New York said that one great advance in recent years in connection with this subject was to be seen in the fact that in very many cases at the present time the administration of anesthetics was entrusted to one who had been trained and specially experienced in that particular line. This brought up the question of quantity of anesthetic to be used, and it was easy to understand how one who was constantly giving anesthetics, who made it a business, could regulate the administration of the anesthetic much better than was the ordinary custom in hospitals where the least experienced men on the staff were selected for that purpose.

The preliminary administration of chloride of ethyl, as Dr. Mann had suggested, or nitrous oxide, as had been the custom with him in recent work, was much more satisfactory than the prolonged and irritating effects which came from the first stage of anesthesia through the administration of ether alone.

Dr. C. C. Frederick of Buffalo, N. Y., did not place much reliance on the idea of patients swallowing the anesthetic, or that ether from the stomach was a source of vomiting, because all had had experience that some patients who were given an anesthetic for a few moments for a slight operation, or for an examination possibly, would vomit more after the preliminary anesthesia of a few moments than they would after prolonged anesthesia given for a major operation. This had been his experience frequently, and vice versa. He had taken chloroform and ether as a matter of experiment, when a student, and he knew when he had taken an anesthetic to the point of loss of consciousnests, which was given to him by a fellow student, it nauseated him. He took an anesthetic once to have a tumor removed from his neck for a considerable time, and after the operation vomited very little. He probably took four times as much of the anesthetic the second time as he did the first time, which was done largely for experimentation.

He agreed with Dr. Mann as to the preliminary use of chloride of ethyl, followed by ether or chloroform. For a year and a half or more he had begun anesthesia with chloride of ethyl, getting

the patient under its influence rapidly, then changing to ether or chloroform. There was no question but that some patients could take one anesthetic better than another. He had used nearly everything that had been suggested in medical journals to quiet nausea from anesthetics, and frankly stated that he did not believe he had ever given a patient anything that seemed to give marked relief. Sometimes he thought one remedy would relieve one patient, yet when used on another it was useless.

Dr. Arthur W. Johnstone had had the same man give his patients anesthetics for the last ten years, and during that time there had been a decided change in the amount of nausea his patients had. In fact, he had reached a point where he never expected it, or that it seldom occurred to amount to anything. He attributed the great decrease in the amount of vomiting after operations largely to careful preliminary preparation of his patients.

Dr. Daniel H. Craig of Boston (by invitation) referred to his work in connection with the use of eserin in the prevention of post-operative intestinal paresis. He did not consider eserin in any sense a specific against post-operative vomiting, but he thought it had just the same effect on cases of post-operative vomiting as gastric lavage, whether done before the patient leaves the operating table or later. The effect of small doses of calomel given before operation, or divided doses of calomel given after operation, with all the various modifications, was the stimulation of normal peristaltic action. With lavage the stomach was emptied. The principal thing was the establishment of normal peristalsis, or approximately normal peristalsis in the intestines below the stomach. Eserin had no effect on the motility of the stomach itself, but it did in re-establishing or preventing stoppage of intestinal peristalsis. Certainly it was done to keep the stomach clear from any fermenting, disintegrating products or partial metabolism, and it seemed to him that eserin did the work far more efficiently and effectively than divided doses of calomel, which necessitated giving the patient medicine by the mouth at a time when she was nauseated and illy prepared to take it.

Dr. Malcolm McLean of New York said that many years ago he handled a good many hundreds of ether cases, and he had noticed in all of those cases in which a large amount of ether was used according to the old plan of using ether, there was a marked increase of neurotic disturbances; and while he fully appreciated all the arguments that had been advanced, one should not lose sight of the practical point, namely, to give as little of the anesthetic as one could. Anesthetics should be given by men who are skilled in this work.

In the speaker's own experience, in operations performed before ten o'clock in the morning, the patients had much less nervous disturbance and less vomiting. He did not know how far this would hold good in the experience of other operators.

Dr. George Gellhorn was inclined to think that one of the foremost factors in producing post-operative vomiting was the

secretions from the mouth and throat, loaded with chloroform or ether. In the stomach the chloroform or ether could not evaporate, and it irritated the mucous membrane of the stomach until vomiting was produced. Vomiting would cease after these secretions had been removed. For that reason lavage of the stomach was of benefit; it relieved the condition at once. Secretions from the mouth or throat should be prevented, if possible, from accumulating. For about a year he had employed as a preliminary the hypodermic injection of scopolamin, together with morphine, about an hour before operation. It arrested the secretion from the mucous membrane. He gave scopolamin and morphine in the proportion of 1/150 of a grain to 1/6 of a grain of morphine. The effect was that the mouth and throat were absolutely dry and remained so during the operation. The patient assumed a pleasant state of mind. After giving the injection the patient was kept in a dark room and no one was allowed to go near her, so that the factor of nervousness, which was frequently disagreeable, was removed. With scopolamin and morphine as a preliminary, the amount of ether used was minimized. Until about half a year ago he employed nitrous oxide and ethyl chloride to induce narcosis, but thought it was dangerous to put a patient so suddenly under profound anesthesia, and it appeared to him more natural to let this change from a conscious to an unconscious state take place gradually. For that reason he had given up ethyl chloride. The amount of ether used after scopolamin and morphine injection was very small, and the pain after operation was greatly reduced. As a rule, the patients could sleep from one to four hours after operation, and when they awoke the first sharp pain had ceased.

Dr. Reuben Peterson of Ann Arbor, Mich., said his experience had been entirely different from that of Dr. Gellhorn in the use of morphine and atropine. He had used the combination six or seven years, giving about 1/6 of a grain of morphine and 1/150 of a grain of atropine, about three-quarters of an hour before the anesthetic was administered. He had seen a difference in regard to the drying of the secretions; before he used these drugs there used to be excessive secretion; there was gurgling; the mouth and throat had to be swabbed out. Since he had employed morphine and atropine, this had almost entirely ceased. He had not attributed, however, the absence of vomiting to the use of these drugs entirely, but had ascribed it to thorough preparation of the patient, and to better methods of administering chloroform and ether.

Dr. Edward P. Davis said that the remarks that had been made concerned patients with whom there had been abundant time for preparation. One was obliged sometimes to operate upon emergency cases, as ruptured ectopic gestation, and other cases of a critical nature which must be attended to at once. In these post-operative vomiting might be exceedingly depressing and dangerous. What could be done to prevent it? While the patient was on the table, and before she was removed before the operation was

quite completed, intravenous saline transfusion or injection would prevent post-operative vomiting, as well as prevent shock. The hypodermic use of strychnia and atropine would lessen shock and lessen post-operative vomiting, as would also the application of heat to the cerebellum, or a hot water bottle or pack to the occiput, and the rectal use of saline solutions, and the hypodermic use of strychnia for the first ten or twelve hours after the operation. In a hospital service, where cases were brought in at all hours of the day or night, where he was obliged to operate on patients in a bad condition, some of whom had been anesthetized by physicians before sent in, by these simple measures they had prevented post-operative vomiting, and he recalled no case in which post-operative vomiting had been a serious or annoying complication.

Dr. Fernand Henrotin of Chicago said that one of the most important factors in the reduction of vomiting as well as in the reduction of shock and of making a patient's recovery reasonably smooth, was washing out of the stomach. He did not know whether lavage was supposed to be used in most instances or not. For a little over a year he had been resorting to quick anesthesia with nitrous oxide preparatory to the administration of ether, using as little of the anesthetic as possible, immediately washing out the stomach thoroughly after every operation, and giving a hypodermic injection of eserin before the patient was taken off the table. The use of this combination in that manner have made an immense difference in the results of his general operative work.

Dr. Boise, in closing the discussion, stated that, as to the vomiting center, it was said to be in the medulla. This had been sufficiently demonstrated, so that it was now accepted as a fact.

As to operating in the forenoon and afternoon, and whether there was any difference in the condition of patients, he had not paid any attention to that particularly, as bearing upon the question of vomiting, but it was a well-grounded opinion with his patients that they did better in all respects when operated upon in the morning rather than in the afternoon.

As to the treatment of post-operative vomiting, he did not suppose that we had reached a point where it could be done away with entirely; nor could one expect all patients to be free from shock. It was well known that some patients vomited very easily, while others vomited with great difficulty. If one could obtund the sensitiveness of the vomiting center sufficiently long, the effect of the anesthetic would be largely eliminated. Again, one should endeavor to dilute as much as possible the anesthetic, so that its irritant action was to a certain extent lost. This could be done by the use of normal salt solution, or by the use of hot rectal enemata etc.

UNIFORMITY IN PELVIC AND CRANIAL MEASUREMENTS. REPORT OF COMMITTEE.

Drs. King, Williams, and Davis comprised this committee and Dr. Williams presented the report. The definition of the

"pelvic Brim diameters" and the "Fetal head diameters" was the same as was adopted by the Section on Obstetrics of the Ninth International Congress held at Washington, September, 1887. To these had been added by the present Committee two diameters of the internal strait, viz., anteroposterior and transverse, and also the external measurement of the pelvis and a few others. The measurements given were obtained in part by striking not exactly an average but a sort of compromise between the varying figures given in text-books of recent date; a further factor in the selection being an effort to arrange the measurements in the English and metric systems without resorting to diminutive fractions. In a few instances the Committee had endeavored to preserve those relative measurements of the head and pelvis requisite for normal mechanism of a natural labor.

SYMPOSIUM.

THE RELATION OF THE APPENDIX TO PELVIC DISEASE OR TO PREGNANCY.

(a) RELATION TO PELVIC DISEASE.

Dr. Reuben Peterson of Ann Arbor read this paper. (See page 225.)

(b) RELATION TO PELVIC DISEASE.

Dr. Hunter Robb of Cincinnati read this paper. (See page 229.)

(c) APPENDICITIS IN ITS RELATION TO PREGNANCY.

Dr. Henry C. Coe of New York read this paper. He said that concerning the importance of the subject it was surprising how little attention had been paid to it and by recent writers on obstetrics. Mundé was credited with having been the first to diagnose appendicular abscess complicating pregnancy; Hancock had reported a creditable case in 1848. Confusion had arisen from the failure of writers to distinguish between simple catarrhal and perforative appendicitis. Hence the difference in their views as to frequency of the condition in the pregnant female. Dr. Coe's experience had led him to believe that many mild cases were overlooked, or been were mistaken for other affections —adnexal disease, pyelitis, colitis, etc. In view of the tendency to obstinate constipation and intestinal toxemia one might expect to find that appendiceal complications were not infrequent during pregnancy. Many a woman with history of former attacks had become pregnant. When all the conditions favored recurrences they were usually of the mixed type. Eight illustrative cases were cited by Dr. Coe occurring in his private practice, four patients recovered without operation, two being operated upon at the third and fifth month without interruption of the pregnancy, while the remaining two were carried through the puerperium and submitted to operation later.

Symptoms.—They were the same as in a non-pregnant female —a sudden attack of general abdominal pain becoming localized in the right iliac region with tenderness and muscular rigidity. The temperature, pulse rate and general disturbances varied with the severity of the disease. Vomiting was probably more common than in the non-pregnant state. Among the cases now under his care was a patient in the fifth month of pregnancy, seen two months ago; after a late supper she was seized with sharp pains over the appendix, without any vomiting, tympanitis and marked localized tenderness, her rectal temperature not exceeding 100° F. The symptoms subsided quickly under the use of laxatives, high enemata, rest, and an ice bag, but the soreness persisted for several days. Examination was negative. There had been no recurrences of the painfl. In another case septic symptoms developed (the patient was in the eighth month) and induration could be felt and a large abscess was incised, the inner wall of which was formed by the uterus. The patient was delivered of a living child two days later and she made a good recovery.

Diagnosis.—Diagnosis was rendered easy when there was a history of previous attacks. The result of the physical examination was usually negative after the sixth month on account of the size of the uterus, which masked the deeply-seated appendix or abscess. The usual general symptoms associated with local tenderness readily furnished a clew to the true condition.

Colitis or fecal impaction might be mistaken for appendicitis, but the symptoms were less severe, afebrile and yielded readily to laxatives and colonic injections. In disease of the right ovary and tube the history, location of the pain, low situation of the tumor (which might be bilateral) and the absence of localized abdominal rigidity were important points. The acute pyelitis of pregnancy was somewhat stormy in its onset, as was a perforative appendicitis, but the pain was nearly always localized over the kidney and the urinary examination pointed to the true condition. There was great difficulty in distinguishing between appendicitis and ureteritis or impacted calculus affecting the lower half of the duct. The absence of intestinal symptoms would be quite significant. Several cases of typhoid fever had been taken through pregnancy, and the patient had been delivered at term, but in none of these was there any doubt as to the diagnosis, although he had known this condition to be mistaken for subacute appendicitis in a puerperal woman. In two cases of acute abscess of the ovary during pregnancy (adherent to the pelvic brim) it was practically impossible to distinguish from perforative appendicitis. Ruptured ectopic, especially the tubointerstitial variety, at the third or fourth month might be mistaken for perforative appendicitis, but the history indicative of internal hemorrhage, low temperature, and pelvic examination would assist in the diagnosis. But ruptured ectopic was not infrequently associated with subacute appendicitis. Torsion of the pedicle of an ovarian cyst or pedunculated subperitoneal fibroid occurring in pregnancy might

closely simulate appendicitis, the two conditions being recognized only after opening the abdomen.

Prognosis.—The so-called "catarrhal" or recurrent type of the disease gave about the same prognosis as in the non-pregnant female. Even when an operation was performed (provided the adhesions were not extensive) pregnancy was no more liable to be interrupted than after ovariotomy under the same conditions. There was, however, more or less risk of recurrences during the puerperium. Perforative appendicitis was a grave complication during the latter months, since the patient might succumb from general sepsis or miscarry and become infected during the puerperium. Also the child's chances of survival were very small on account of the direct liability to infection through the umbilical vessels. If an abscess developed the uterus formed part of its walls. Then there was danger that the organ might become infected by direct continuity or premature delivery occur; the adhesions might then be ruptured and then pus would diffuse throughout the cavity.

Treatment.—The speaker's views coincided with those of Pinard, viz., treat the appendicitis in pregnant women according to the same rules as in the non-pregnant. In mild cases carry the patient to term if possible, and operate as soon as convenient after the puerperium if the trouble persisted. With the persistence of the local pain and if the induration was felt, operate as in any other case. Perforation and abscess formation called for immediate operation, rapid work, as little handling of the uterus as possible, and free drainage.

Prophylaxis.—Since the toxemia of pregnancy was often of intestinal origin, as in appendicitis, careful attention should be paid to the regulation of the bowels by the use of laxatives, high enemata, restricted diet, and the drinking of large quantities of water, etc. As Kelly had aptly said and rightly, the true prophylaxus in the child-bearing woman who had had a well marked attack of appendicitis was an interval operation.

(d) Relation to Pregnancy.

Dr. A. Lapthorn Smith of Montreal read this paper. (See page 234.)

(e) Relation to Pregnancy.

Dr. J. Clarence Webster of Chicago read this paper by title.

Dr. Seth C. Gordon was very glad that the papers to-day echoed views he had expressed; he was particularly glad to know the Society had changed its views upon this subject. The appendix was practically a useless organ, and no physiologist or pathologist had found any use for it. His invariable rule was whenever the abdomen was opened to remove the appendix, whether good, bad, or indifferent. Whenever called upon to remove the tubes and ovaries he removed the appendix as well. The appendix he considered to be a useless bag. The Society, he

believed, was taking a step in the right direction; conservatism meant the conserving the health of the patient and they, as surgeons, were bound to do it; they should do that which would give the best health in the future. He believed that every man and woman who had arrived at the years of discretion would wish the appendix taken away. Ninety-nine out of one hundred patients would say when the abdomen was opened, "Remove the appendix as well."

Dr. Frederick W. Sears of Syracuse said that appendicitis occurring in the pregnant woman should be treated as in the non-pregnant state. The pregnant woman bore operations as well as the non-pregnant. The patient should be properly prepared for the operation and as little of the anesthetic given as possible. His experience was limited to three cases:

Case I.—Appendicitis occurred in this patient when she was in her third month of pregnancy, and there was supposed to be beginning gangrene. She was removed five miles to the hospital and a large perforation was found on operation. Drainage was instituted, recovery followed, and the patient returned to her home and delivered her child at term without difficulty.

Case II.—This was a more difficult case to diagnose. The patient was between the fifth and sixth month of pregnancy. She had been bedridden for six weeks before he saw her. Whenever she assumed the upright position she suffered greatly from pain and a tumor could be distinguished at McBurney's point. It was decided that the appendix should be removed. The appendix was found to be in a state of catarrhal inflammation, and the tumor turned out to be an ovary which had gone up out of the pelvis. No disturbances followed, and in time her child was delivered.

Case III.—This was his own case, and he had previously carried her through attacks of appendicitis prior to her pregnant condition. During her third month vomiting set in and she suffered intensely from the diseased appendix. Operation was performed, the muscles being separated so as not to weaken the abdominal wall. All went well.

He wished to again emphasize the fact that the pregnant woman would bear these operations well if the same precautions were taken with them as with the non-pregnant woman.

Dr. Andrew F. Currier said he was glad to participate in this discussion, although it was known that he was to take the unpopular side of the question. He did not believe it was good surgery to remove any tissue or organ of the body when one was not convinced that it was diseased. Of course, in certain cases in which there was a strong probability of malignant disease, one could then make an exception. But with that one exception the function of the surgeon was to preserve rather than to destroy, to build up rather than to remove. He believed that a good deal of what had been said, especially regarding the use of the appendix, would have to be acknowledged as being a "Scotch verdict"; it was not proven. The appendix was made of

lymphoid tissue and possibly assisted in the digestion of food. The testimony given in the first two papers read in the symposium, if it proved anything, proved to his mind, and led him to the conclusion that was directly opposite from that drawn by the two readers of the papers. In both papers accounts were given of 50 per cent. of the cases in which a microscopical examination was made and nothing pathologically wrong was found. And yet the conclusion was drawn that because these cases *might* give trouble in the future, these organs should be removed. He did not believe that that was a logical conclusion, and was not warranted by the principles which influenced them as practicing surgeons. The question was, are we going to benefit our patients by removing these organs? He believed there were to-day as many people who would say if the abdomen was to be opened, "do not remove the appendix," as would say, "Remove it." He thought this Society should strike a higher note if they were to look upon the subject from a scientific aspect rather than from a sentimental one.

Dr. Clement Cleveland of New York said that he wanted to array himself on the side of the radical view of the subject. Believing as he did in the theory of evolution, he looked upon the appendix as a useless organ, and the many surgeons who took this view removed that organ when they entered the abdominal cavity. In cases where the appendix had been removed for inflammation, it was the rule that such patients were vastly improved and their general condition was better and that their digestion was far better. He believed that it was universally believed that where the appendix was not found to be diseased and still was removed, that there was no history given of any harm having resulted. Yet in cases where the appendix had not been removed he had seen harm result. It was his habit whenever he was called upon to open the abdomen, before doing anything else, to look for the appendix and anchor it, so that he could easily get hold of it later to treat. That had been his habit for a number of years, and he had never yet found anything that would deter him from continuing to do so. The arguments of Dr. Currier did not appeal to him.

Dr. Fernand Henrotin said that the best operations were based upon a reasonable amount of experience, and that there was no doubt but what Dr. Cleveland had stated was true so far as his clinical observations went. The appendix was not only responsible for inflammatory attacks, but also for certain dsypeptic and colicky symptoms that occurred, and which, in most instances, were not diagnosed as being caused by the appendix. He had seen three striking cases. One case was operated upon by a couple of doctors for fibroids eight or ten months before; at that time, although the appendix was found to be a large one, they decided to leave it. He later operated upon this patient for an acute attack of appendicitis. In another case a patient was operated on for an ovarian cysts three years prior to the time he saw

her; a second cyst occurred on the opposite side. Upon operation, quite a little pool of pus was found under the appendix. In another case there was found a grape-seed, the only instance of the kind he ever saw; it was situated in the middle of the appendix, and produced appendicular colic, distress, and, at times, pain. These three cases demonstrated to him the danger of leaving in the appendix, and he believed it should be removed even when apparently healthy, when the abdomen was opened for any cause. In each of the cases reported there was supposed to be left a healthy appendix. Therefore, Dr. Henrotin's rule was to remove the appendix unless there were distinct contradictions.

Dr. Herman J. Boldt of New York referred to the difficulty of making a diagnosis of appendicitis. The idea that one could palpate an appendix in every case was erroneous. In many instances of appendicular disease where it was impossible to make any satisfactory diagnosis, appendicitis was diagnosed merely because it was suspicious. He referred to a woman pregnant at the fourth month, who had had a number of attacks of appendicitis and who complained of acute pain in the abdomen. Under ether nothing distinctly could be felt. Because of the existence of this pain the abdomen was opened and an appendix seven inches long was found, and which was curled upon itself. So soon as the appendix was removed the woman got along well.

In another instance a woman had been quite well for years. While an anesthetic was given for a certain purpose, the husband asked that the appendix be removed. On removing it, an accumulation of pus was found in its terminal portion, which was strictured off, and so he might go on and relate many other instances where, on removing these appendices, definite evidences were found of subacute attacks of inflammation. He was not referring particularly to the catarrhal forms, but to the subacute forms. These cases could only be suspected by the dull and intermittent pains, and yet one could not be positive that subacute appendicitis was present.

Dr. James F. Baldwin of Columbus, Ohio, said that for eight years he made it a routine practice of examining the appendix in all cases in which he opened the abdomen, and that practically in all cases he removed that organ. Two years ago, Kelly opposed this practice, but now the pendulum was swinging the other way. To-day he practically removed the appendix in all cases. In all, he had done about 3,000 abdominal sections, and he removed the appendix in at least 1,800 of these. He had seen three cases occurring during pregnancy. In one operation was postponed and performed after delivery. In another case the symptoms were quite grave, and yet the woman went to full term, and operation was performed afterwards. In the third case a presumptive diagnosis of ectopic was made. Under chloroform, this was excluded as a cause of the right-sided pain. The history of the case was that of a subacute attack of appendicitis. The patient

went to full term, was delivered of her child, and returned home without operation.

Dr. EDWARD P. DAVIS said that during pregnancy it was especially desirous that the appendix, when giving trouble, should be removed. As a general proposition, the pregnant woman had a condition of the intestines which lessened peristalsis, and this predisposed to an invasion by the colon bacillus and tended to set up inflammation in the uterine adnexa or appendicitis. In the pregnant woman, metabolism was maintained just as in any normal condition. She had physiological blood plethora and took the anesthetic well and would not abort if operation was performed. The operation for the removal of the appendix was especially applicable in cases of pregnancy, and should not be delayed until after delivery. Again, any inflammation which extended about the sides of the uterus might complicate the condition seriously. In one case he had in mind there was a catarrhal condition of the appendix; operation was not performed, and the result was that the uterus acted badly during labor and the child was lost. This showed that inflammation at the side of the uterus might interfere with its mobility.

Dr. ARTHUR W. JOHNSTONE had operated for appendicitis in pregnant women four times; the women were pregnant from two and a half to four months; all made good recoveries and without miscarrying.

With regard to inverting the tip of the appendix, he said that the worse case of intussusception he ever saw was caused by this procedure, with a resulting band across the head of the cecum and the intestine were squeezed through the opening thus formed. The abdomen was opened and this peculiar condition found. He reduced the mass of intestines by squeezing them as one would the teats of a cow. He protested against inverting the tip of the appendix. His own method of removing the appendix was a very simple one. The appendix was ligated with a ligature; beginning about three-quarters of an inch from the ligature, he stripped down the peritoneum; then he stripped down muscle, cutting through it, and then the mucous membrane; a collar was formed, which he destroyed with a red-hot needle.

Dr. MALCOLM MCLEAN said that he had not yet arrived at a point where he would remove an organ simply because it might in the remote future give rise to trouble. One might as well claim that the mammary gland of a woman who was not going to enter the state of bringing forth children should be removed because in so many cases carcinoma entered that gland. It seemed to him that to remove an organ because of the possibility of its becoming diseased in the future was illogical. He thought that possibly if he followed up two, three, or four cases of appendicitis that had followed laparotomies, he then might be influenced as some had been; but after an experience of twenty years, doing abdominal sections and not having met with a single case of appendicitis

following, he did not feel that he would be at all justified in removing an appendix that was not diseased.

Dr. Ely Van de Warker said that all this talk sounded to him like ancient history, and the same kind of discussions then was held regarding the ovary. He said he knew of no reason why a perfectly healthy appendix should be removed when the abdomen was opened; one should not remove healthy organs just because they feared something was going to happen to it. To him it was too absurd to even discuss. Disease of the appendix was comparatively rare. He had never removed a healthy appendix, and he had never seen harm result from leaving the appendix. To remove this organ when not diseased he believed to be unscientific and unfair to the woman.

Dr. J. Riddle Goffe said that no man who had taken out a healthy appendix could prove that he had benefited the woman. He believed there was positive danger in removing healthy appendices. He knew of two cases occurring in New York City; in one case the removal of the appendix proved without question to be the cause of the patient's death. He did not believe anyone was justified in removing healthy appendices. The number of patients that had been reported at this meeting as having developed appendicitis after operating for other abdominal conditions was small. Dr. Baldwin had reported 12 or 15 out of 3,000 operations.

The evidence favoring removal of healthy appendices was so slight that he did not believe it to be at all warrantable.

Dr. Philander A. Harris of Paterson raised his voice against the removal of healthy appendices when the abdomen was opened for other conditions. There were strong arguments against such a procedure, and one was that there was danger in every instance by prolonging the operation.

Dr. Reuben Peterson said that in spite of the fact that they had been quoted as being unscientific in their investigations, it had answered some purpose, and every man depended upon his own experience in solving these problems. He had tried to solve the problem, and in a way that appealed to him. Many of the gentlemen who had discussed the question had begged the question entirely. Dr. Currier had stated that he would not take out the normal appendix; how did he know that it was normal? How can one tell the condition of the appendix except by means of the microscope? Just because one left in the appendix when doing abdominal section, and then had to open the abdomen eight or fifteen times out of 3,000 cases did not prove anything. He believed that a great many women suffered from appendicitis after operations for pelvic disease: if such was the case, and if it could be taken out with but little danger, to his mind, no danger at all, then he believed it was the surgeon's duty to remove the appendix unless there was distinct contraindications. In spite of the criticisms that had been given, he believed this procedure to be logical, scientific, and the only way, but, of course, no one would think of removing the appendix if there were contraindications any more

than they would the uterus. He said he was trying to do what he considered to be the best thing for his patients and sentiment did not enter into his actions at all. Consent to remove the appendix should always be had. Before he did any operation in a public hospital, he always went to the patient to be operated upon and obtained consent to whatever in his mind he believed to be the best for that patient, and the same consent was asked for among his private patients. Unless we remove the appendix when we open the abdomen, we are leaving behind that which will be a menace to the patient's life for weeks and months, or years to come.

Dr. A. Lapthorn Smith of Montreal said that whenever he suspected the appendix he removed it. Many women will come to the doctor and say, "Doctor, I am sick, and have been suffering for years; I want you to cure me." He might operate, find and remove pus tubes, and find many adhesions, and he removed as well the appendix. The only reason for removing the appendix was in many instances after doing operations upon the pelvic organs the women were not cured. Certain ill-defined symptoms were present, which would not be if the appendix was taken away. All wanted the patients to recover their health and remain well. It hurts a doctor not to have a patient make a perfect recovery, and he said he was convinced that patients did not make good recoveries if the appendix was left.

Second Day, May 26.

SYMPOSIUM.—THE RADICAL ABDOMINAL OPERATION *versus* THE VAGINAL OPERATION FOR CARCINOMA OF THE UTERUS.

(a) The Vaginal Operation.

Dr. Carlton C. Frederick of Buffalo read this paper. (To appear later.)

(b) The Vaginal Operation.

Dr. George Gellhorn of St. Louis read this paper. (See page 1.)

Dr. Fernand Henrotin had operated a number of times for carcinoma of the uterus, and had a special preference for the vaginal route. At the beginning the vaginal operation was not as satisfactory as at present, and had certain discouragments. The fact that surgeons had better knowledge in handling these cases, a better knowledge of the technique, and a better experience than they had in the past had made the vaginal operation a success. For a long time he did the abdominal operation, and had a very discouraging time. Not only is the danger much greater, but it was evident that the disease in its entirety could never be completely removed, nor could it be if one aimed at removing the lymphatic glands. A man might remove a uterus through the

vagina and succeed in cases that apparently were beyond help. During the past five or six years he had had some remarkable cases that got well and remained well two years, some with but little hope offered them at the time of operating. Personally, he had established the rule that whenever he had a case of cancer of the uterus he did the work through the vaginal route as thoroughly as possible and took away as much of the parametrium as he could. During the last years his results had been more satisfactory than before.

Dr. A. Lapthorn Smith had very strong views on this subject. It was very important that the general profession should send their cases of uterine cancer to them earlier for operation, a great deal earlier than they were now doing. In order to get the most encouraging results, they should operate upon these patients at least three months before the microscope showed that the condition was a cancerous one. He believed that success and the welfare of the patient depends more and more upon operating earlier. Dr. King and himself had had cases which they believed to be cancer three months before the pathologist stated positively that such was the case, at a time when it would be too late to benefit the patient materially by operation. In Montreal, cancer of the uterus had practically been stamped out, stamped out by repairing the cervices even when injuries resulted not larger than the size of a pea. This resulted in giving him a more helpful view of cancer of the uterus, and the results of operating had been getting better and better. He called attention to another important point, and that was the contagiousness of cancer. He said he could not now prove this to be, so they believed that cancer was contagious, and they acted accordingly. When they removed cancerous uteri they took care to prevent infection of the stump, as if they were certain it was a contagious disease. This was a point in favor of making the division through the tissues by means of the cautery or heat to prevent infection. When in Berlin, he saw an operator open the abdomen and remove the uterus and the whole of the vagina by means of the cautery knife. Dr. Smith did not believe that any operation with an immediate mortality of 33 per cent. and a later one of 100 per cent. was going to benefit the woman. In these hopeless cases he curetted away everything in sight and cauterized what was left, and the women, as a rule, were made quite comfortable for two or three years.

Dr. Byford of Chicago would like to mention one or two conclusions he had arrived at regarding cancer of the uterus. When the iliac glands were affected, or the glands along the side of the pelvis, there was an inflammatory condition of the connective tissue which could not be gotten rid of, especially that next to the bladder or next to the rectum. Therefore, the field of this operation must necessarily be limited, especially as the mortality was so very great. After describing his method of dealing with these cases, drawing together the peritoneum and stitching as carefully as possible over the vagina to prevent extension of the carcinoma because on al-

most invariably left behind some carcinomatous tissue and the liability to infection was present, he left in a vaginal tampon for three or four days, pulling a little out of the vulva, withdrawing it gradually. The principal point in his work was after tying and bringing the broad ligament together and clamping, to cut far away from the cervix, but if the glands are much involved even this was of not much use.

Dr. P. A. Harris thought a great debt of gratitude was due those who were engaged in this work, particularly when it was remembered that there were so few that were doing the work properly. A mortality rate of 21 per cent. should, and would, be reduced. The figures indicated that when cancer had extended into the pelvic glands the mortality was very high, and this extension occurred in 27.5 per cent. of the cases. The disease, he believed, should be followed more closely, because it was present in these glands in little more than one-quarter of all cases of cancer. Against this must be weighed the extensive death rate.

With regard to the vaginal operation, one must consider its mortality, and he believed that he could say, and without fear of contradiction, that the mortality exceeds 5 per cent. if extirpation of the uterus be done through the vagina; three-quarters of the patients presented to them did not present the scientific proof of the disease. He did not wish to be understood as speaking discouragingly of any operation which might lead to something better.

Dr. H. J. Boldt said that the consideration of the results of extirpation of the uterus for cancer should be from several points, such as (1) the location of the disease, and (2) the age of the patient. With regard to the location, one might meet with cancer of the cervix proper and again with the vaginal portion. All realized that in cancer of the cervix proper the parametrium would be involved earlier than in the other location, and here one dealt with a very malignant neoplasm. In cancer of the vaginal portion, the vagina was involved more frequently than other parts. With regard to the age of the patient, the younger the patient the greater the mortality. As to the relative value of the abdominal and vaginal operations for the removal of cancerous uteri, he did not believe that the abdominal operation was going to make up our statistics because of the greater and greater rate of mortality that was confronting them, a mortality much higher than that given when the vaginal route was chosen. He referred to a paper read by him on this subject, and, at that time, he advocated cutting away from the cervix as far as possible, and now the paravaginal method of Schuchardt was accomplishing all that he had aimed at. But there were instances in which the abdominal operation was called for, such as quite large uteri and small vaginæ. Then the abdominal operation should have the preference over the vaginal, although the mortality rate was higher. He believed the direct mortality was nearly 7 per cent. In the future he intended to take away as much of the para-

metrium as was possible. He had cut the uterus on three occasions, but without immediate danger, ureteral fistula having formed. He believed that they should make more definite diagnoses of malignant disease before operating.

Dr. Reuben Peterson said this discussion before the members of the Society showed that they were disgusted with the results obtained by the older methods of operating for cancerous uteri.

That had been his experience in doing both the vaginal and abdominal hysterectomy for carcinoma. By the vaginal method, he had endeavored to remove the uterus and as much of the parametrium as possible, and yet his patients died after a longer or shorter time. Consequently, his results being so bad, he considered carefully the feasibility of the radical abdominal operation, and he must state *a priori* that he considered this operation with disfavor. Could one get all the glandular tissue in the pelvis, and get outside far enough to overcome the great increase in the mortality which was sure to result from the radical abdominal operation? We were quite certain there would result a high mortality. Still, from his own experience with the radical operation for carcinoma of the breast, although such cases were not strikingly analogous, it was his attitude in those cases to try and see if something more could not be done; consequently, during the last two years he had adopted the radical abdominal operation. He expected a high mortality, and he got it. The high mortality was not due to the fact that the operation was difficult, but because of the poor selection of cases. He operated upon one woman who should not have been operated upon at all. Two of his cases died from shock on the operating table; four of the six cases lived, but the time has been too short to report definitely regarding the ultimate outcome of the operation. It should be remembered that in doing the abdominal operation, going well outside the uterus and taking out the parametria that one could often strip down the bladder from the cervix with the use of a right-angled clamp, clamping the vagina in such a way that there would be practically no danger from infection. This he had done in all but one case. In this way he thought the danger from any primary infection could be overcome. This operation should not be compared with the vaginal operation; this simply was a palliative procedure, and extended the life of the patient over a certain number of months.

Dr. A. P. Dudley said that he, too, was in the habit of repairing all injuries produced at the time of labor as a prevention of carcinoma. After removal of the cancerous uterus, he had seen recurrences occur in the anterior wall of the vagina between the bladder and the vagina. He now believed in the efficacy of the combined operation. The vaginal connections to the uterus should be severed and then the abdomen opened in order to remove the glands. It had been his pleasure to have been in close touch with the men mentioned by Dr. Gellhorn, those who were ultra-radical, and who removed all they could with safety. When uterine can-

cer was far enough advanced to bring the patient to the surgeon, there had already occurred infection of the glands. In such cases the only proper method consisted in the combined operation, the use of the cautery for the vaginal portion and the ligature for the abdominal portion under proper circumstances. There was one drawback to the use of the cautery; it took longer for the vaginal tissues to heal. He said again that he favored the combined operation.

Dr. Currier had been much interested in the discussion, and had looked forward to the day, hoping for some information upon this subject, the greatest of the unsolved problems in medicine. He had been disappointed. The outlook was sad, and as hopeless at it had ever been. When they came to us for treatment, they came, as a rule, too late. The question might be raised: What could be accomplished by an earlier operation. It had long been advocated that a parous woman should be examined at periods of six months in order that the disease might be discovered in the earlier stages; he had tried this, but found it could not be done; the women would not submit to such examinations, when they felt that they were well. The first symptom usually was hemorrhage, usually after coitus, and then it would be found that extirpation was impossible because of the advances made by the disease. The solution of the difficulty, he believed, would come through the laboratory, such laboratories as had been instituted in Buffalo; when they had discovered the cause of the disease and its primitive conditions, they would then be in a better position to attack it from a surgical or other standpoint. With regard to the mortality, according to the testimony of those who had spoken, it had not been improved upon, and the more radical operations advocated surely brought higher mortalities. He cautioned against increasing the danger of the operations by being too radical.

Dr. Wathen said it was true that the results of operating for cancer of the uterus had not been at all encouraging nor, in fact, for cancer occurring in any part of the body. While they had not all agreed as to details of the operative procedures that had been thus far instituted for the removal of cancerous uteri, it was very evident that they had practically agreed upon one point, *i.e.*, to remove as much of the infected tissues as was consistent with a reasonable mortality. It was clearly decided that they could not remove glandular involvement in the pelvis without a mortality that might be said to be prohibitive. Further, they could not with certainty remove all the infected glands in the pelvis. It was too dangerous, did no good, and did not prolong the patient's life. By going far out into the parametric tissues, one might remove all the invaded structures.

Dr. Palmer referred to the relationship of lacerations of the cervix and the development of cancerous uteri, and said he had never seen a case of cancer of the cervix but what developed in child-bearing women. Their plain duty, therefore, was to at-

tempt to prevent the difficulty from arising. He was surprised at the statements made by Williams of London, for all could trace cancer of the cervix to injuries that had occurred during parturition. He believed that every woman who had undergone parturition should be examined by touch and speculum, and any injuries that had occurred in the perineum, vagina or cervix should always be repaired; this would go a long way towards eradicating this much dreaded disease, cancer of the uterus.

Dr. Frederick said that the discussion had brought out many facts, and they could be summed up as follows: Operations of more extensive nature, which were calculated to remove all the infected glands in the pelvis, had been followed, and given varied results for various reasons; there had been large mortality rates, and there had been failures to cure patients and prevent recurrences. Patients with cancer of the cervix so far advanced as to involve the pelvic lymphatic glands were hopeless cases. He believed, too, that it rested with the laboratory to devise some means, some antitoxin, which by its systemic action would rid the patient of this dread disease; such results would not, in his opinion, occur through surgical efforts. Operations should be done only in those cases where the disease, as shown macroscopically, by touch and sight, was supposed to be confined or limited to the uterine tissue. If there was involvement of the parametrium, or cellular tissue outside the cervix, he believed it to be hopeless to operate, because then we simply mutilated our patients. He said it was a fact that he had recently read a paper before the American Medical Association on high amputation of the cervix for the relief of these patients in so far as relief could be obtained, not opening the peritoneum, but dissecting up the anterior and posterior peritoneal folds, ridding the patient of as much infected tissue as was possible. The same results were obtained as if they had removed the uterus entirely. In this operation the one great danger of opening the peritoneum was avoided, and the mortality was practically nil. In far advanced cases, curetting and cauterizing the uterus gave better results, and the patients lived longer and in better condition than if a total extirpation had been done.

Dr. Gellhorn closed the discussion, and said that the statistics he had presented were unimpeachable. He believed that Dr. Currier had taken too pessimistic a stand. The paravaginal method of Schuchardt promised 40 per cent. of surviving cases. Of 100 cases, 12 died only as the result of the paravaginal method; of the 88 remaining, 40 per cent. so far have remained well for five years. He believed this to be very encouraging, and he thought they were justified in continuing this work in this line, especially as some improvements were always possible.

(*To be continued.*)

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of April 11, 1905.

The President, J. Riddle Goffe, M.D., *in the Chair.*

Dr. Hermann J. Boldt presented several specimens.

DIFFUSE PURULENT PERITONITIS FOLLOWING CRIMINAL ABORTION. —ABDOMINAL PAN-HYSTERECTOMY.—DEATH.

B. C. was seen in consultation on March 2. Four days previously she had an abortion performed by a midwife. On the day before (March 1) she was curetted. A diagnosis of diffuse peritonitis was made, and the abdomen opened about two hours later. In the general peritoneal cavity there was a large quantity of purulent serum, and in the true pelvis, thin pus. The uterus was removed and the abdomen thoroughly washed out with saline solution. Drainage per vaginam was employed with extreme head and trunk elevation. Although the woman rallied well from the effects of the operation, soon after she began to sink and she died on the following morning. The specimen was interesting because to the naked eye the appearance of the organ was normal almost, and yet on looking over the report of the pathologist, the pathological changes were intense. Sections of the cervix and body had the appearance of suppurative inflammation, all the coats being infiltrated with epithelioid cells, mono- and poly-nuclear leucocytes, while, at rare intervals, are small pockets of pus cells. Sections of some parts of the tube were almost normal, there being but slight evidence of inflammatory reaction. Other sections showed acute suppurative inflammation, the lumen being occluded with endothelial and pus cells and detritus. The uterus and cervix showed many bacteria, small diplococci and streptococci. Similar bacteria were to be found in the tube, but very few in number.

PUERPERAL SEPTIC INFECTION: RESECTION OF RIGHT UTERINE CORNUA WITH PART OF UTERINE BODY, BROAD LIGAMENT AND ADNEXA.

The patient was delivered of her first child February 16 with practically a normal delivery. On the third day after delivery a slight elevation of temperature manifested itself, which gradually increased to 105.2 F. It varied from this down to 101. When seen in consultation on March 5 the temperature was 104.2 F. There had been a prolonged chill on March 2, and since then chilly sensations. The abdomen was distended, pulse 140 and of poor quality. The uterus was not markedly increased in size nor appreciably change in consistence for this period of the puerperium.

There was some induration of the left broad ligament and thickening of the left adnexa. Uguentum Crede and vaginal suppositories of collargol were used. On March 9 another marked chill occurred and an examination showed an increase of thickening on the left side. It being evident that no improvement could be expected from a continuance of non-surgical treatment, an operation was undertaken the same evening. The cornua of the uterus and the border of the uterine body were infiltrated, likewise the entire broad ligament, and the tube and ovary, but there was no marked abscess, yet it was evident that the structures involved were the cause of the infection process continuing, although it was doubtful if by removal of the discernible affected area the causative factor could be removed. The resection was begun at the uterus beginning about half an inch outside of the apparently affected area, then the entire broad ligament and adnexa. On the following morning the temperature was normal and the patient felt very comfortable, but during the afternoon she had another prolonged chill followed by high fever, and she died at 10 P.M. Although in the tissues removed the presence of streptococci was not shown, yet there could be no doubt of the existence of such infection from the history of the case.

The pathologist reported that the specimens of the tube showed intense inflammation of all the coats, especially the muscular layers, with a moderate amount of small abscesses. The lumen was open and the mucosa but slightly affected. The ovary was congested, but otherwise normal. Sections of the cornua and ligament showed intense inflammation with abscess formation similar to that of the tube. Only a few small diplococci were seen. No streptococci or other pathogenic bacteria were present.

LARGE OVARIAN TUMOR.—CARCINOMA OF OMENTUM.

The patient, 56 years of age, said that the first symptoms of her illness did not begin until six months ago, when she began to suffer from dyspnea, much distention and pain over both iliac crests, heaviness in the abdomen and frequent micturition. The abdomen was distended by a large multilocular tumor, which was evidently firmly adherent to the surrounding structures; the pelvis was also filled out by the tumor, and in this locality the firmness of adhesions could be positively determined on examination. Much ascites was also present. The diagnosis of carcinomatous ovarian tumor was made and operation performed on February 13. A large quantity of sanguinous fluid was evacuated upon section. Unfortunately the wall of the tumor was broken into at the beginning while endeavoring to determine the firmness of the adhesions to the intestines. The extirpation was then proceeded with and with much difficulty concluded. Because of the length of time consumed in the extirpation, and the condition of the patient, no attempt was made at this time to extirpate the tumor-like carcinomatous omentum. No pelvic glands seemed involved. The report of the pathologist as to malignant degeneration of the

ovarian tumor being uncertain, and because of the excellent condition and improvement of the patient, after the first operation, a second one for the removal of the omentum was undertaken on March 2. The extirpation of the omentum was comparatively easy. In two places the bowels were slightly injured and repaired, but it required only one-half an hour to complete the entire work. The woman did well for nearly three days and then quite suddenly died, seemingly from heart failure. Inasmuch as the omentum was proved to be carcinomatous, it was reasonable to believe that the ovarian tumor was also of this type. These specimens of cancer again prove the necessity of operating on all ovarian tumors as soon as possible after their discovery.

The pathologist said that the microscopic examination of the wall of the large abdominal tumor showed the walls to be made up of a layer of rapidly formed connective tissue, in which the blood-vessels showed extensive hyaline degeneration. The inner wall was covered in by a layer of irregular, columnar simple and stratified epithelium. Both the epithelial layer and the mucoid appearing contents of the cyst showed very extensive hyaline degeneration and necrosis, so much so that it was impossible to form a definite idea as to the character of the epithelium, except that its tendency after proliferation seemed to be towards degeneration rather than towards ingrowth and infiltration. The general character of the growth corresponded to the ordinary adeno-cystoma of the ovary and probably followed the usual course of these growths, it was innocent, this being the evidence shown in the portions sectioned. These growths, however, not uncommonly, became malignant, and though there were no changes in this particular tumor indicative of such change, he had found that occasionally minute areas of malignant alteration in other parts of the growth might escape examination, and they were certainly growths to be removed as soon as detected for this reason.

DOUBLE TUBAL PREGNANCY.

The patient was seen on March 15 with Dr. O. Maier. She was 27 years old, had been married four years and had one child three years ago. She thought she had an abortion thirteen days ago, but she had been constantly bleeding during the past six weeks. Pain in the sacral region was present. Her bowels were constipated. There were cramp-like pains in the lower abdomen at irregular intervals and frequent micturition. The blood lost was dark brown. The diagnosis was made of tubal pregnancy, either in the process of abortion or slow rupture. Operation revealed the abdomen filled with fresh blood and clotted blood. The left tube probably had ruptured during the examination under ether. The bleeding part of the tube was resected, and the corresponding ovary attached to it. Examination of the right adnexa revealed the uterine end of the tube to be somewhat distended by blood and the abdominal end changed into a globular tumor, which was interpreted to be caused by another gestation on this side. The

tube was resected and the ovary attached to the uterine cornua. The pathological report verified the suspicion. Cases of double extra-uterine pregnancy are very rare. The patient was out of bed from the fourth day on.

The pathologist's report showed the proximal end of the tube a little larger than normal in the proximal half. The distal half was enlarged into a round hard tumor, firm, with a few small soft areas on surface and partly covered with recent exudate. On section, dark brownish red in color, soft, the center occupied by a cyst with smooth walls and filled with a clear fluid. The microscopical examination showed a mass of blood and fibrin with many placental cells and chorionic villi.

UTERUS REMOVED BECAUSE OF UNCONTROLLABLE MENO- AND METRORRHAGIA.

The patient had been treated by various methods for a period of nearly five years without bringing about more than temporary relief of the bleeding. She had now gained her former good health.

The pathologist reported that very little endometrium appeared in the sections made, the glandular tissue being replaced by a thick cellular exudate, made up almost entirely of small round cells with but very few polymorphonuclear leucocytes and plasma cells. Penetrating between and separating the muscle fibers was a similar exudate. Some of the sections showed involvement of the entire muscle tissue, others but little, but the larger part of the tissue sent was apparently affected. The diagnosis was made of subacute inflammation.

BILATERAL ADENOCARCINOMA OF OVARIES; CARCINOMA OF LOWER PART OF SIGMOID FLEXURE; GLANDULAR METASTASES; METASTATIC NODULE BETWEEN CERVIX AND BLADDER; EXTIRPATION OF OVARIAN TUMORS, UTERUS AND RIGHT BROAD LIGAMENT.—EXTIRPATION OF RETROPERITONEAL GLANDS, PARTS OF OMENTUM, AND RESECTION OF CARCINOMATOUS BOWEL.—RECOVERY FROM OPERATION.

A patient, aged 25, who had been married five years, and who had had four children, the last two years ago, had been feeling weak, and had more or less pain in the right iliac fossa and hypogastrium during the past four years. Suddenly, two weeks ago, she began to have severe pain in the lower abdomen and she also noticed a swelling in the lower abdomen, which was said to have rapidly increased. The woman was very anemic, but had a fair quantity of adipose tissue. The abdomen was distended by ascites and a very large right ovarian tumor was made out which had some nodular irregularities upon its surface. It extended upward to within an inch of the umbilicus. Deep pressure upon the smooth parts of the surface conveyed to the fingers the impression that it was a cystic tumor. The diagnosis of carcinoma of the ovarian tumor was based upon the presence of ascites, irregular contour of the surface of the tumor, rapid development and pain. On open-

ing the abdomen on March 23 about 2,000 c.c. of bloody serum was evacuated. The few adhesions of the tumor were readily separated and the neoplasm extirpated. The metastatic growth between the cervix and bladder he thought could be extirpated without sacrificing the uterus, but unfortunately he neglected to examine the other ovary for involvement at this time; had it been done, some time in operating could have been saved. The right broad ligament had numerous small nodules in it and it was, therefore, resected and the uterine surface closed over in the usual manner, as could be seen on the specimen. Now a number of large retroperitoneal glands were removed, and all the metastases in the omentum. Then the other adnexa were examined, and it was found that the left ovary had degenerated into a carcinomatous neoplasm. After its removal the uterus was extirpated, it being found that the secondary tumor was imbedded too deep into the cervix for removal. The extensive metastatic involvement of the lower end of the sigmoid and upper part of the rectum was resected, and an end-to-end anastomosis made with suture. It was remarkable that the woman could have a fecal evacuation at all, because, as might be seen in the specimen, the patency of the bowel was reduced to a caliber not more than one-half centimeter in diameter yet she only had complained of ordinary constipation. The patient's bowels moved on the same day of the operation, and she had been out of bed since the sixth day. It might be seen on the surface of the tumor that the neoplasm had broken through in two places, and that the bowel metastasis was caused by the contact of one of the breaks in the tumor, that part having been in contact with the involved bowel. The operation was of long duration, requiring two hours for completion.

The pathologist stated that sections from the outgrowth of tumor showed a luxuriant atypical glandular structure, bound together by moderately fine connective tissue. More abundant near one border, it penetrated deeply into the small amount of muscle tissue remaining. In some places the glands showed a tendency to break through the outer wall and to form small groups of cancerous nodules or nests. The diagnosis was made of adenocarcinoma. The section from other parts, except the broad ligament, showed metastatic involvement of similar appearance.

DISCUSSION OF DR. BOLDT'S SPECIMENS.

DR. MALCOLM MCLEAN.—I should like to ask Dr. Boldt if there was much accumulation of fluid in the abdomen.

DR. BOLDT.—Yes, there was a large quantity of bloody serum in both the instances reported.

DR. FRANCIS FOERSTER.—I should like to ask Dr. Boldt for his reason in letting patients up so soon as six days after severe operations.

DR. BOLDT.—Because it has been my experience that they make better and quicker recoveries. I allow them to get out of bed as soon as they like and to remain up as long as they want to. If

there should follow an abdominal or stitch abscess then of course they are returned to bed; otherwise they do about as they please within a few hours after abdominal sections, unless there are strong contraindications.

Dr. G. G. Ward.—Do I understand that you use catgut for the abdominal incision in these cases that you allow to get out of bed so soon after laparotomy?

Dr. Boldt.—Yes.

SPECIMEN OF GALL STONE.

Dr. LeRoy Broun presented a gall stone 1⅜ inches in length and 1 inch across.

Dr. J. Riddle Goffe reported

A CASE OF CESAREAN SECTION.

He said that the two procedures that had most recently come within the scope of the vaginal method of operation were the operation for the relief of inversio-uteri and vaginal Cesarean section, or as the Germans called it, *"ader vaginale kaiserschnitt."* It was of the latter that he wished to speak. This operation was definitely presented to the profession by Dührssen in 1895. The indications for the operation, as he presented them, were (1) Abnormal conditions of the cervix and lower segment of the uterus, such as carcinoma, myomata, rigidity, stenosis or pouch-like distension of the uterine portion. (2) Dangerous conditions of the mother which might be removed or relieved by prompt emptying of the uterus, such as affections of the heart, lungs or kidneys, especially in cases of puerperal eclampsia. Since the appearance of Dührssen's paper this operation had been resorted to nearly one hundred times, and with most satisfactory results. Indications for these operations had been those mentioned by Dürhssen, including also premature detachment of the placenta with internal hemorrhage and hyperemesis gravidarum at six months of pregnancy. The advantage of the operation were the rapidity with which it could be performed and its comparative safety. The latter factor was obtained by avoiding entrance into the peritoneal cavity, and by the free subsequent drainage secured.

The operative technique consisted in exposing the cervix by posterior vaginal retractor or speculum and grasping the cervix on either side of the os by two pairs of traction forceps. A transverse incision was made in front of the cervix, and the bladder was dissected from the uterus, to a point above the internal os. The anterior wall of the uterus was then incised in the middle line, from the external, up to and a little beyond the internal os. If this did not afford sufficient room for delivery, the posterior vaginal incision was made, down to the peritoneum and this membrane was stripped off the posterior face of the uterus as high as it might be necessary to incise it. The posterior wall was also incised, opening up in the interior of the uterus. By keeping directly in the middle of the uterine segment comparatively little hemorrhage was en-

countered. The child could then be delivered with forceps or grasped by the foot, turned and hastily delivered by the hand. The placenta was then expressed or scooped out by hand, the uterine cavity packed with gauze and the incisions closed with interrupted sutures of chromic gut. The average time required for the procedure was about six minutes.

The case which he had to report was as follows: Mrs. M., aged 29, married seven years, one child five years ago, instrumental delivery, presented herself April 5th with the following history. She had menstruated regularly, although excessively since the birth of her child, until October, 1904, when menstruation ceased. She had no discharge for thirteen weeks; at that time she noticed a slight spotting of her night clothes, which continued quite regularly. She never felt life, nor did she realize that she was pregnant. One week ago, she was taken with severe bearing-down pains and backache, had an abundant gush of waters from the vagina and an alarming hemorrhage. A doctor who was hastily called, told her that she had a tumor of the womb; a second doctor, the following day, informed her that she was having a miscarriage. The pains had continued very severe in character for an entire week, but nothing had been accomplished except exhaustion of the patient. There had been a constant leucorrheal discharge.

Examination revealed a long narrow cervix sufficiently patulous to admit the index finger to the internal os, where the buttocks of the fetus could be felt, the membranes having ruptured. The uterus was in a state of tetanic contraction upon a dead fetus.

The following morning under ether narcosis he attempted to dilate the cervix and to empty the uterus. After spending some time in endeavoring to dilate the internal os which was extremely rigid, he abandoned it, and grasping the cervix on either side made a transverse vaginal incision and dissected the bladder from the uterus, quite to the peritoneal fold. With scissors, the uterus was then incised in the middle line from the external os to a point about one inch beyond the internal os. This gave a sufficiently large opening for the prompt delivery of the fetus and placenta. The uterus was then irrigated with hot saline solution, packed with iodoform gauze, and the incision closed with interrupted catgut sutures. A gauze tampon was also inserted in the vagina. The operation was of brief duration, quite free from hemorrhage and most satisfactory in every respect. The size of the child indicated about a six months' pregnancy. The patient had had no temperature and was making an uninterrupted recovery. An abundance of milk appeared in her breasts on the third day.

Dr. W. S. Stone.—I can report a case in which I did this operation for accidental hemorrhage. I started to dilate the very rigid cervix, and it seemed to me that I was going to tear it if I dilated rapidly enough to deliver the woman with safety. I therefore quickly carried out the procedure described by Dr. Goffe. I had a trifling complication as my upper stitch was not placed in quite the right position, and a small hematoma formed in the cellular

tissue which caused no trouble and was quickly absorbed. I think the field of application of this operation is wider than generally considered, and as more men accustomed to surgical procedures do ostetric operations, it will be more often performed. There can be no doubt but that it is a much better operation in certain cases with a rigid cervix than the misnamed "manual dilatation," which is in reality ordinarily a manual tearing.

Dr. E. C. Savidge.—About twelve years ago I did an undesigned Cesarean section by the vaginal route, and cite the case in this connection to show (1) the line of least resistance, between the uterus and bladder, and (2) the recovery of the patient.

These are the circumstances: A large, muscular, young woman went into normal labor—L. O. A.—and was progressing favorably, when about dawn, pains stopped, the fetal heart ran down, and it became necessary to apply forceps quickly.

The patient was in a small inner room which her bed almost filled. The nurse was a neighbor who had volunteered. Climbing on the bed, I put the patient under chloroform, handing the mask to the neighbor. Then, standing in the door way, the forceps were locked, and comfortable progress was being made. But the nurse upset the chloroform the patient came out into anesthetic frenzy, and kicking me through the doorway, across the adjoining room, rose on her hands and impaled herself on the forceps with the nearby doorpost. The forceps went through the cervix, stripped up the peritoneum between uterus and bladder, and disappeared in the abdominal cavity—but all extraperitoneally. The forceps and child were delivered through this rent, the patient was sent to Roosevelt Hospital, where she made complete recovery. A year later, I delivered the same woman of a second child.

Dr. Joseph Brettauer.—If I am not mistaken Dr. Goffe's patient had not advanced to full term; I believe he said she had gone to the sixth month only. Therefore, I do not know whether this case belonged to the class of cases reported as vaginal Cesarean section. I should like to ask Dr. Goffe why he proceeded in the way he did, as I believe if there are urgent indications for immediate delivery such a step might be advisable.

Dr. J. Riddle Goffe.—It seems to me that when a hasty operation is required this method is the simplest and the quickest at hand, and I fail to see why it should not become universally practiced. Anyone who has performed it never has any criticism to make upon it. It is entirely extraperitoneal. The bladder is dissected off in front and when necessary posterior incision is made, the peritoneum being stripped off from the posterior face of the uterus beyond the internal os; when the two incisions have been made up to this point the general cavity of the uterus becomes exposed and the fetus is readily lifted out. Dr. Brettauer's question I have already answered in my report. The patient was six months' pregnant, and had been in severe labor for one week, being deprived of sleep and nourishment, and came to me in such an alarming state that I determined to try and deliver her at once.

She was not at full term, but I do not see why this operation is not applicable where it is deemed necessary to deliver promptly, whether at full term or not.

HYDATID DISEASE OF THE OVARY, WITH THE REPORT OF A CASE.

Dr. W. Travis Gibb.—Hydatid disease of the ovary was such a rare condition that he felt justified in reporting a case which was the second reported in the United States. A review of medical literature showed the disease to be of such rare occurrence that it was regarded as clinically unimportant. Dr. Gibb mentioned seven cases of hydatids of the ovary that he was able to locate in medical literature. Hydatid disease in man was a comparatively rare affection and particularly so in North America. There have been reported in the United States and Canada only about 250 cases. Literature would seem to show that the disease was largely on the increase in the United States during the past twenty-five years, but this increase was probably more apparent than real, as it is only recently that the reporting of interesting cases has become common among the members of the profession, and, again, it is only in recent times that marked advances in surgery have brought these growths in the range of effective treatment. However, among domestic animals the disease is actually on the increase. Hydatid disease in both man and animals is due to the accidental introduction into the alimentary canal of the ova of the Tenia Echinococcus, a minute tapeworm inhabiting the intestines of the dog and wolf. These animals are the determinate hosts of this parasite, while man and other animals are the intermediary hosts in which the larval or bladder stage of the parasite is undergone in its cycle of development. The adult taenia has its habitat in the small intestine of the dog or wolf and is about one-quarter of an inch long, and consists of four segments, the last segment exhibiting the ripe condition and containing the impregnated ova. The ripe segment is larger than the others and before it separates from the series another has begun to develop. Its first segment or head is extremely small and is supplied with four suckers surrounded by two rows of blunt hooklets. Its life is about seven weeks. The feces of dogs are the chief source of infection. The eggs of the adult tenia must find their way into the stomach of the individual. The terminal segment taken into the stomach loses its outer capsule in the process of digestion, setting free the hooked embryos which proceed to make their way into the surrounding tissues. They frequently make their way through the walls of the veins and are carried as emboli along the blood current and find lodgement in some distant structure where they undergo their transformation into hydatid cysts.

For dogs to become infested with the adult echinococcus it is necessary that they ingest the live scolices contained in the hydatid cysts. The scolices are liberated and passing into the small intestines, attach themselves to the mucous membrane and are thus developed into the mature tapeworm. The reports of observers who have examined the intestines of large numbers of dogs state

that this disease is exceedingly rare in this country. But owing to the fact that this parasite is but little if any larger than the intestinal villi among which it hangs, it would not be surprising if one or more of the parasites should escape even the keenest observer.

Hydatid disease prevails to a greater or less extent in all parts of the world, but it is particularly prevalent in Iceland where it is called the liver plague. It is estimated that 15 per cent. of the population of Iceland are thus affected. Australia is rapidly beginning to rival Iceland in the prevalence of this affection among its inhabitants, due mainly to the fact that it is a grazing country where, owing to the scarcity of water men and cattle drink from the same source.

According to Lyons of Buffalo, nearly 60 per cent. of the cases in this country occur in early adult life, between the ages of twenty and forty. Finsen found that in Iceland but 42 per cent. of the cases occurred between the ages of twenty and forty, while a much larger number occurred after the age of sixty. In Europe the larger percentage of cases occurred among females, while in this country males were most frequently affected. This discrepancy is explained by the fact that a large number of our cases occurred in young adult male immigrants, while the older people and women did not emigrate. Ninety per cent. of the American cases occurred among foreign-born subjects.

Echinococcus disease is found in tissues having a good vascular supply, but rarely in unstriped muscular fiber. It is most frequently met with in the liver, but also frequently found in the omentum, peritoneum, lungs and spleen. The cysts have been found in the brain, heart and medullary canals of long bones. The female pelvic organs are rarely the localities chosen for the primary deposition and development of hydatids, but usually become involved by extension of the disease from other adjacent organs. The disease prevails chiefly among the lower classes and particularly among those who are ignorant and slovenly in their habits.

The hitherto recorded cases of ovarian hydatids have all been unilocular in character of comparatively small size, and filled with daughter and granddaughter cysts, these in turn containing the scolices and hooklets of the hydatids. The unilocular type of hydatid tumors is the most common variety observed, only 7 of Lyons' 241 cases were multilocular. The only apparent difference between these unilocular hydatid cysts of the ovary and ordinary ovarian cysts was the fact that they contained daughter and granddaughter cysts and had the peculiarly elastic cyst-lining characteristic of hydatid growths. In all but one case where the ovarian infection was primary other organs were found involved in the hydatid degeneration.

In their development hydatid cysts are first found as small white dots with thick transparent capsules having concentric lamellations and enclosing coarsely granular contents. In four or five months the cysts have attained a diameter of one-half to one inch

and are provided with an outer or cuticular layer of highly elastic tissue which curls up in a characteristic manner when cut, and an inner or germinal layer, from which are budded echinococcus heads and brood capsules or daughter cysts. When these scolices are fully developed they are about 0.3 mm. in length and represent the head and neck of an adult echinococcus. The daughter cells are also composed of two layers, an outer or germinal layer and an inner or cuticular layer, reversing the order of the mother cyst.

Deve says that the scolices and the germinal capsule can give rise to new hydatid growths, so that during the course of operations the greatest care should be exercised to prevent the escape of the cyst contents, for wherever the scolices find lodgment there a new colony may develop.

The fluid contents of hydatid cysts is colorless, odorless, neutral in reaction, with a specific gravity of 1,006 to 1,015; it contains 1.2 to 1.4 per cent, of solids which consist of sugar, inosit, a trace of urea, creatin and sodium chlorids. Leulart found succinic acid in hydatid fluid and claims that it is almost pathognomic, as it is found in but few other living organisms.

Most hydatids of the ovary resemble ordinary ovarian cysts and a differential diagnosis would be almost impossible unless the hydatid were sufficiently large to enable one to elicit the almost characteristic sign of hydatid fremitus, but where the tumor is small this sign would be impossible to obtain.

The treatment for ovarian hydatids is removal by operation, the same as is employed for any ovarian cyst. Recognizing the fact that ovarian cysts are usually secondary to the disease elsewhere, great care should be exercised to thoroughly examine the entire abdominal contents for other tumors, and when all are removed the abdomen should be thoroughly flushed out to prevent the escape of any scolices.

Hydatid tumors occasionally undergo spontaneous cure owing to the death of the echinococcus elements, absorption of the fluid and retraction of the cyst wall.

The case of ovarian cyst which Dr. Gill reported was that of F. McG., aged 57; born in Ireland; widow; had one living child and one miscarriage; her mother died of old age, having had ten children; her father died as the result of an accident; no member of her family had ever had a tumor. She was a domestic and had been in this country for many years. She was alcoholic, drinking considerable beer and whiskey, especially on an empty stomach. She never lived where dogs were kept, but visited, especially when drinking with a friend who kept dogs. About eight months ago she began to notice that her abdomen was enlarging and that she was losing flesh. This condition seemed to follow a severe fall in which her ribs and shoulder were injured. She states that during the past eight months the size of her abdomen varied greatly, occasionally reducing almost to normal and again becoming greatly enlarged. She was tapped once or twice and fluid containing cysts was withdrawn, but she refused operation. She

vomited frequently and on several occasions the vomited material contained many small cysts, which she assured us was exactly like the material we obtained through the trocar. When her abdomen was distended she suffered greatly from dyspnea, vomiting and cardiac irregularity. January 31, 1905, she was found to be greatly emaciated with an enormously distended abdomen. She was unable to walk and suffered great distress from dyspnea and general weakness. The abdomen was not tender and resembled the distension of ascites, except that it was more rounded and there was flatness instead of tympany on percussion at the most prominent point. The area of liver dullness was decreased. Percussion developed a well-marked hydatid thrill. Vaginal examination was negative. The diagnosis of hydatid disease presumably of the liver was made, but as the patient refused operation a trocar was introduced and six or eight ounces of fluid containing many small cysts was withdrawn, which, under the microscope showed the characteristic hooklets. The patient finally consented to operation and under general ether anesthesia a 3½-inch incision was made midway between the umbilicus and pubes, and on entering the peritoneal cavity it was found to be filled with cysts of varying size, many of them apparently free in the cavity. Most of the cysts were typical hydatids containing daughter and granddaughter custs floating in a clear transparent, though slightly mucilaginous fluid. In some of the cysts the contents were thick and translucent.

On attempting to empty the abdominal cavity it was found that bands of tissue formed a network in all parts of the cavity, forming the separation between the different collections of cysts. It was only after breaking up these bands, many of which had to be ligated on account of their size and vascularity, and washing out the abdomen that it was found that the major part of the cysts originated from and formed a large tumor of the right ovary. This mass was adherent to everything in all directions, but the adhesions were easily broken up. The pedicle of the tumor was the right broad ligament greatly enlarged, with distended vessels. It was ligated with a catgut matress suture and the tumor removed. The Fallopian tube could be traced through its entire course and was but little enlarged and unaffected by the hydatid disease. The uterus was small and the left tube and ovary normal. It was found that the liver, spleen, kidneys and bladder were unaffected by the hydatid growths. The intestines were not involved in the infection, but were matted together by rather weak adhesions. The greater omentum was entirely gone, leaving but a small fringe along the greater curvature of the stomach and this fringe was filled with small cysts. The walls of the stomach were involved in the hydatid degeneration to a considerable extent. As many of the cysts as could be easily approached were removed, either whole or by incision, and the abdomen was thoroughly flushed with many gallons of saline solution, the coils of intestines separated and a careful search made for cysts. A Mikulicz drain

was introduced through the lower part of the abdominal incision and the upper part closed in layers. Recovery was uneventful.

The pathologist reported that the tumor and its contents showed the presence of echinococcus hooklets and scolices.

In this case it seemed that the primary infection occurred in the walls of the stomach, traveled along the greater omentum and then involved the right ovary by extension. The fact that the tumor began to develop immediately after the patient had a severe fall seems to indicate that a small hydatid cyst had existed for some time which was ruptured by the fall, scattering the contents throughout the abdominal cavity, when the scolices began to develop in whatever locality they found lodgment. It was estimated that thirty pounds or more of hydatid material was removed from the woman's abdomen. The ovarian portion of the growth was a multilocular hydatid tumor considerably larger than a man's head. It was not circumscribed, but was continuous with the growth involving other organs. When all the adhesions were broken up the ovarian growth formed a well-defined mass, denser towards its center and involving no other pelvic organ.

While the removal of this growth was as complete as it was possible to make it, many small cysts were left in the walls of the stomach and in the remains of the omentum and there would probably be a speedy recurrence of the condition. In a case reported by Cullingworth and Clutton the abdomen was opened eight times before the disease was finally overcome.

Dr. Henry C. Coe.—I have seen only two cases of hydatids of the abdomen, one when I was in Vienna. The cyst evidently grew from the liver and gave an exquisite "hydatid thrill." A still more interesting case occurred in the Woman's Hospital when I was Pathologist there. It was then the custom to tap ovarian cystis more frequently than is done at the present time, and I had a specimen of fluid submitted to me which contained multitudes of these scolices and hooklets, which enabled me at once to make a diagnosis of hydatid cyst. For some reason no explorative incision was made, so that the exact origin of the disease remained in doubt.

[By a curious coincidence the speaker removed an echinococcus cyst of the liver four days later. It was the size of a small orange and was easily enucleated from the under surface of the right lobe, leaving a large oozing surface which was sutured with catgut. The patient is making a good recovery. The diagnosis of gall-stones was made on account of the situation and hard, nodular character of the tumor.]

Dr. W. Travis Gibb.—When I operated upon the patient there was a fringe of small hydatic cysts on the lower border of the stomach. I removed all I could but, was compelled to leave some. I have no doubt but that there will be a recurrence. I saw the patient yesterday. She feels perfectly well, but I think her abdomen is enlarging at the upper portion. There was one case reported by Cullingworth and Clutton of England, where the

abdomen was opened eight times to remove hydatid growths, and the patient finally made a recovery.

Dr. C. C. Barrows.—Ten or twelve years ago removed a right kidney with large hydatid cyst in which the diagnosis had been made prior to operation. The disease seemed to have been limited to that organ. A complete recovery followed. This case I followed for two or three years and she never had, to my knowledge, any further involvement.

Dr. H. C. Taylor.—I have seen one case of hydatid disease which was interesting because I followed it for a number of years. The woman was operated upon twelve years ago by Dr. Tuttle for hydatid disease in the omentum. She remained well two years when Dr. Cragin operated upon her for hydatid disease of the spleen; the cyst was not removed but drained and finally closed. She remained well for five years about, and then returned with a hydatid cyst which was thought to be ovarian. The abdomen was opened and a hydatid cyst was found at the side of the rectum posterior to the peritoneum, and independent of uterus and appendages. It was removed. I saw the woman within the past year and she is free from hydatid disease.

TRANSACTIONS OF THE WOMAN'S HOSPITAL SOCIETY.

Meeting of February 24, 1905.

The President, James N. West, M.D., *in the Chair.*

Dr. Le Roy Broun reported two cases of

"APPENDICITIS IN WHICH THE LOCATION OF THE PAIN AND TENDERNESS WERE NOT IN THE TYPICAL LOCATION."

Case I.—Mrs. X., aged 41, the mother of two children, had been under my care for some years. During the spring of 1902, while six months pregnant, had a sharp attack of appendicitis from which she recovered without operative measures. At the time of this first attack the symptoms, localization of pain and tenderness were all typical. Her confinement and subsequent recovery were uncomplicated. The husband and patient refused an internal operation for the removal of the diseased appendix. In the fall of the same year, I was called to see the patient in the morning after what was regarded by her husband as an attack of gastro-intestinal disturbance. She had nausea, diarrhea, and colicky pains in the abdomen. The patient's facial expression was good, the pulse slightly accelerated, and there was a general slight tenderness over the abdomen. Deep pressure on the right side developed no pain or signs of discomfort. On the left side, however, she had marked tenderness. Calomel was ordered in divided doses, and

when the patient was seen again in the afternoon, nausea had subsided. The temperature and pulse were about the same, and the pain in the abdomen less, but there was marked tenderness on the left side of the median line. No pain or tenderness existed on the right side. Castor oil was ordered to be taken at bed time. Appendicitis was prominently in my mind from the first visit. The following morning, I was impressed with the changed appearance of the patient. The nurse reported that she had passed a comparatively good night, being free from any colicky pain. The facial expression was, however, drawn, the pulse was accelerated, the bowels had moved freely from the laxative given the night before. Abdominal examination still gave persistent tenderness on the left side, but none on the right. No mass was felt in the abdomen. The drawn expression of the face was explained by the husband, who is a physician, as one of fatigue, a condition he had observed at times in his wife when under considerable strain. She was seen at my request within a few hours by an eminent surgeon of this city. He in turn was met by an equally eminent diagnostician shortly after. At the conference it was decided that unless the patient improved by the following morning, an exploratory incision should be made. The patient's condition not being improved at my late night visit, the operation was done during the night. The condition found was a general suppurative peritonitis, the cause was perforating appendicitis, the position of the appendix was on the right side and in a normal position. The patient died three days after the operation.

Case II.—Mr. Z., aged 21, single, suffered from gastrointestinal disturbance which was followed on the succeeding day by marked pain in the hepatic region with slighter pain over the appendix associated with fever. The pain in the hepatic region subsided within two days, that over the appendix persisted, with a slight leucocytosis gradually subsiding. The patient's recovery was complicated with an attack of pneumonia. While convalescing from the pneumonia, he had a second attack of appendicitis. In this attack the pain was again greatest in the hepatic region, and least over the appendix. It appeared that the disturbance was in the gall-bladder, and that the pain in the appendicular region was only one of extension. After the subsidence of the acute symptoms of this attack, the appendix was removed. It was post-cecal, pointed upwards, and measured slightly over six inches. The patient made an uneventful recovery. The gall-bladder was not diseased.

I report these two cases to call attention to the fact that the pain of an acute attack of appendicitis, while usually located at what is known as McBurney's point, is not unfailingly so.

Deaver in his classic work on appendicitis says: "The location of the initial pain in the majority of instances is umbilical or periumbilical, next in order of frequency in the epigastrium; and least commonly in the right iliac fossa. In recurring cases the initial pain of the later attacks is often referable immediately to the right side. The location of what may be termed the secondary pain

varies in different cases. It depends to a great extent on the position and direction of the appendix; after the development of the circumscribed peritonitis, it is usually referred to the right iliac fossa. It is not uncommonly, however, referred to the left side of the abdomen.

If the appendix is long and overhangs the brim of the pelvis the pain will be referred to the left side of the abdomen along the course of the spermatic cord towards the left testicle or the region of the ovary.

If the appendix is pointing upward, lying either behind or in front of the cecum, the pain may be referred to the region of the kidney or liver. Tenderness is one of the most constant and valuable signs of appendicitis. It is always present over the appendix, and when the appendix is long, the point of greatest tenderness may be on the left side of the median line. The tenderness when situated in the pelvis, may not be detected except by rectal or vaginal examination.

Dr. West showed a

VESICAL CALCULUS WITH HAIRPIN NUCLEUS.

A girl complained of frequent and painful micturition. An examination under ether revealed the stone and it was removed through an incision in the vesicovaginal wall.

Dr. James N. West read a paper entitled

A NEW OPERATION FOR LACERATION OR OVERSTRETCHING OF THE LEVATOR ANI MUSCLE.

(See original article, p. 196.)

Dr. Broun.—How do you identify by sight the muscular tissue and the fascia? Will Dr. West tell us the difference between this operation and the ordinary Hegar operation which is followed to a modified extent by Drs. Thomas and Chambers in that they use no buried sutures?

Dr. Emmet.—Why make any special attempt to denude the fascia and muscle since it is all thoroughly bared in the process of stripping off the mucous membrane and dissecting up the flap on either side?

Dr. Dudley.—The levator ani is a sphincter muscle and once ruptured, its sphincter action is lost. The transversus perinei then draws the levator ani apart. I can see the good in the method advised, but I can also see that the statement that it is limited to specialists is very true.

Dr. West.—Recognition and separation of the fascia and muscle is the chief difficulty of the operation, and I find that there is generally a little fascia clinging to the mucous membrane when the latter is dissected, and if these fibers are followed, the fascia and muscle are found. Of course, if the solution of continuity has been complete, as in the cases reported, retraction of the muscle is very great. The difference between this operation and Hegar's is this. The denudation, when completed, is practically the same

but Hegar did not attempt to pick up the muscle and fascia. This procedure is analogous to an operation for hernia. Dr. Emmet has asked why I made a special denudation. I did the last operation somewhat differently from the three reported. I made the denudation first in the shape which I wished the final denudation to be. Turning in the edge of the mucous membrane with some very fine catgut I tucked that in with my fascia suture. Silver wire is used because I believe that is the best material for external sutures. When properly placed they are not irritating. For internal sutures I have used forty-day catgut only. Kangaroo tendon would be a little coarse.

The subject of the evening,

"LIMITATIONS OF CONSERVATIVE SURGICAL WORK ON THE TUBES AND OVARIES," was then discussed.

DR. DUDLEY.—I consider that any man who dares to open the abdomen of woman, free adhesions, take out portions of the appendages and drop the remainder for nature to take care of, is not doing conservative surgery. It is a misnomer to call that conservative surgery, unless one wishes to give it the title of conservation of certain tissues. The limitation of conserative surgery. so far as my knowledge goes, is that the condition to be treated is produced by non-septic causes. The conditions in the order in which I will mention them, which may require treatment, may be divided into: (1) Non-septic affections of the appendages; (2) gonorrheal affections of those structures; (3) those of streptococcic origin, and (4) dermoids. I place them in this order of increasing seriousness. I would rather do conservative work on an ovary and tube that was gonorrheal than upon one with streptococcic infection. The dermoid condition is deadly. If the lesion is non-septic, as in cases of uterine displacement, or adhesions, the result of inflammation, the cilia which line the tube will continue functionally active and the woman may become pregnant even though she has only half a tube and half an ovary. If the affection is of gonorrheal origin, the tubal cilia are destroyed and there is no means of carrying the ovum from the ovary into the uterus and the woman is barren. In these cases it is a wise man that removes and does not do conservative work.

If the disease is streptococcic in origin, the cilia are not destroyed. The woman may have had several abortions produced, and yet after conservative treatment may be impregnated and have a normal pregnancy and labor. Conservative work may be not conservative.only but ultra-radical. Now what are the limitations? One's judgment as an operator is the limitation.

DR. BACHE EMMET.—I fully concur with the view expressed by Dr. Dudley to the effect that the term "conservatism" should not be limited to the idea that one should constantly strive to save a little tissue here and there without due regard to the ultimate welfare of the patient.

In other words, each surgeon should hold large views when dealing with pathological questions and plan and execute his

work with the purpose of not having to retrace his steps, owing to the persistency of the symptoms. It frequently happens that one has to deal with an ovary studded with distended follicles. One may open a number, cauterize the cavities and then stitch the cortex. One may believe that good work has been done, when as a result one will shortly observe a marked enlargement of one or more follicles perhaps to the size of a walnut or pigeon's egg, producing intense pain and calling for a second operation.

I remember well presenting such a specimen at one of our meetings, removed three weeks after the first operation, and I have met with another couple of similar experiences. It is my practice if a suspicion of a like condition comes to my mind to unhesitatingly remove the entire ovary or, if circumstances demand it, to leave the smallest possible fragment for continued function.

The same idea applies to treatment of the tube. Remove not only all diseased tissue which one sets out to remove, but such other as has been involved by extension or threatens to become so. In other words, do such surgery as shall best conserve the interest and welfare of the woman.

Dr. Broun.—The question resolves itself into the necessity of each acting according to his best judgment as the necessity arises in each operation. He can follow no hard and fast rule in what is supposed to be conservatism, and at the same time act in the best interest of his patient. As has been said, at times the most radical measure is the most conservative in the end. My own general rule is to save every part of an organ that I feel can be of use to the patient in the future, and which can be left without hazarding the patient's well being at the time of the operation.

Dr. Bissell.—I am in accord with Dr. Dudley, but it is difficult to always determine the origin of tubal diseases. It is not uncommon for us to find extensively diseased appendages where previous to operation we were unable to elicit a clear history of either gonorrheal or puerperal infection. In regard to conservative work upon the ovary, I make it a fixed principle to save all healthy tissue. A case has just come under my observation which illustrates the necessity and advisability of the procedure. From the left ovary of this patient I removed a cyst (dermoid and simple) about the size of a large orange, leaving a small piece of healthy ovarian tissue. The right ovary at the time of operation was examined and appeared healthy. Fourteen months after this operation a tumor in the right side was discovered; upon opening the abdomen I found the right ovary so involved by cystic formation as to require removal of the entire organ. The left ovary, which had been previously operated upon, was found to be free from adhesion and normal in every way excepting as to size. We all concede the danger of dermoid cysts when their contents soil the peritoneal cavity. When they rupture, I would suggest the use of slightly diluted alcohol, which can be poured into the abdominal cavity without fear of injurious effect upon the tissues and with confidence in its protective power.

Meeting of March, 28, 1905.

EXTRAUTERINE PREGNANCY.

Dr. Taft reported a case of extrauterine pregnancy in a woman 31 years of age, who came to his office July 22, 1904, with the following story:

Previous history, negative as regards pelvic inflammation. She had had three miscarriages, the first at four months, the second at two months, and the third at three months. She menstruated regularly June 7, 1904, and again from July 12 to July 21. This unusually long period, not accompanied by pain, caused her to consult a physician. Vaginal examination showed merely a retroflexed uterus. No swelling of the tubes or ovaries or localized tenderness of the broad ligaments could be detected. The uterus was replaced manually, and a hard rubber pessary inserted. August 6, two weeks after her first visit, she reappeared, stating that she had had no trouble in any way since her first visit. An examination made at this date revealed a swelling of the left tube, slightly larger than an English walnut, and somewhat tender. Her history and this rapidly developing swelling of the left tube led to a positive diagnosis of extrauterine pregnancy, and operation on the following morning disclosed an ectopic gestation of the left tube into which a small hemorrhage had occurred. A few tablespoonfuls of old clotted blood were also present in the peritoneal cavity. This case is noteworthy for the early diagnosis, permitting prompt operation. It also demonstrates the doubtful propriety of replacing a retrodisplacement, in the presence of symptoms suggesting extrauterine pregnancy, for doubtless the manipulations caused the slight rupture.

Dr. Taft also showed a specimen of tubal pregnancy of two and a half to three months, which he had recently removed. Aside from the specimen, this case was of interest on account of the blind history and uncertain physical signs. Patient's age, 25 years. She came under the care of Dr. Allen Williams of Hartford, Dec. 20, 1904, giving a history of a miscarriage at two and a half months in April, 1904, and a second miscarriage in July, 1904. She then menstruated regularly August 12, and flowed for one day, September 10. At this time she had some abdominal pain, and two weeks previous to visit the pain had been severe. A bimanual examination at this time seemed to indicate a pregnancy of from three to four months. On January 1, 1905, she flowed again for one day. February 2 she came to Dr. Williams' office complaining of insomnia. On March 10 Dr. Williams saw her again on account of nausea, and at this visit she insisted that she could feel fetal movements. Her pains persisting and becoming quite sharp and peritonitic in character, Dr. Williams requested the speaker to see her on March 10. A physical examination made then by both physicians left them uncertain as to her condition. The abdomen was very tympanitic and somewhat tender, although no marked muscular rigidity was present. The os was soft, vaginal veins were

enlarged, and breasts and areola gave indications of the existence of pregnancy. It was, however, absolutely impossible to map out the pregnant uterus, and at this time an ectopic gestation was not seriously considered. She still complained of occasional sharp pains, but no attacks of faintness, etc., to indicate a possible hemorrhage. On March 19 she expelled decidual membranes, and Dr. Williams then made a probable diagnosis of extrauterine pregnancy. A few days later she was seen again by Dr. Allen Williams and Dr. Marion Williams, and at this time an exceedingly sensitive mass on her left side, apparently the size of a five months' pregnancy, could be mapped out indistinctly. It was impossible to determine whether this was a part of the uterus. A laparotomy was at once advised, and performed at St. Francis Hospital. The abdomen was found full of old clotted blood, and an ectopic gestation of the right tube was found, bound down by recent peritoneal adhesions. This tube was as large as a closed fist, and, besides a large blood clot, contained a perfectly developed fetus of about two and a half to three months. Apparently the fetus had been dead some time, and had atrophied somewhat. On account of the recent peritonitis, and the quantity of old clots, central abdominal drainage was made. The patient had a normal temperature and pulse one week after the operation.

INTESTINAL OBSTRUCTION.

Dr. West presented a section of the large intestine at the junction of the rectum with the sigmoid flexure, a small appendix and a small piece of bone, apparently a piece similar to a piece from a mutton chop. These specimens were removed from a patient who died after operation for the relief of complete obstruction caused by them. The section of intestine showed a carcinoma which surrounded and closed it as tightly as if a string had been tied around it. In the center of the carcinomatous mass was the bone, and above the bone was a mass of mucus. The appendix was attached to this. The points of interest in the case were the youth of the patient as a subject of carcinoma, and the sudden intestinal obstruction, which is rather unusual with a carcinoma, due to the lodgment of a little piece of bone in the center of the mass and of a plug of mucus upon the bone, thus making the intestinal obstruction complete. The attachment of the appendix to the mass around the rectum was peculiar. The carcinomatous character of the growth was suspected at the time of operation, and it was thought wise, in view of the fatal outcome, to remove the growth. The patient died from the shock about seven hours after the operation.

Dr. Baldwin showed a specimen of extrauterine pregnancy which he regarded as one of abdominal pregnancy going to term without rupture. The child was fully formed. Dr. Baldwin thought the case must have been an interstitial pregnancy in the beginning, but that later the gestation sac became surrounded by a complete coat of muscular tissue from the uterus and separated from the torgan, leaving a perfectly healthy uterus. A clean,

healthy tube and ovary was shown on one side of the gestation sac. The speaker thought there could be no doubt about the sac being muscular tissue on account of its character and thickness.

The history of the case was as follows: Mrs. S., aged 29, married ten years, is the mother of six children, the last one twenty-two months old. All of the births had been normal. The first three were breech cases, and the last three normal presentations. In April, 1903, her feet commenced to swell, and she had nausea and vomiting and thought she was pregnant. Her family physi- ried ten years, is the mother of six children, the last one twenty- days, from the 9th of June to the 21st, with no considerable pain, and not again until the latter part of September, when she flowed regularly and naturally. In the early part of September she felt life, and continued feeling it until December. In the middle of December, labor pains came on. The physician told her she had a dead child and that he would simply wait until nature threw it off. She was in bed with severe pains until she came to the hospital in March.

Dr. Baker said he remembered a case of Dr. Syms that had been five months past her nine months period of pregnancy when operated upon. It was the only case of extrauterine pregnancy so near to full term that he remembered having seen.

Dr. West remarked that the specimen showed that the fetus was contained in one horn of the uterus and that the ovary was in the usual position. It looked like a bicornate uterus. Perhaps the Doctor could throw some light upon that, and tell how he came to the conclusion that it was a tubal pregnancy and not a pregnancy in one horn of the uterus.

Dr. Grad asked how Dr. Baldwin concluded that he was not dealing with a double uterus. It might be that the pregnancy occurred in the region between the two uteri.

Dr. Baldwin states that his reason for believing that this was neither a double uterus or a bicornate uterus was that there remained a perfectly healthy symmetrical uterus whose cavity had no connection with that of the fetal sac. The uterine wall was intact, and he did not consider it possible, from the appearance of the specimen, that it could have been a double uterus. The extent of attachment was not more than two inches. It might possibly have been a bicornate uterus. He regarded the case as developing from an interstitial pregnancy.

CALCIFICATION OF CHORIONIC VILLI.

Dr. Goffe said that about twelve or fourteen years ago he had presented to the Obstetrical Society a specimen consisting of a uterus and its appendages removed by hysterectomy. The peculiarity of that case was that the woman passed frequently by vagina large numbers of little curicules, bony in character. She had a large multiple fibroid, which had been treated by electricity. The speaker removed the tumor and found the uterine cavity full of these small calculi. The specimen was referred to the pathologist

and Dr. Freeborn reported that he regarded them as calcified chorionic villi. These calculi had never been shown before. The tumor and about one-half pint of the calculi were presented to the Museum of the College of Physicians and Surgeons.

CONSERVATION OF OVARIAN TISSUE.

Dr. Hyde said that about four years ago Dr. Dickinson reported a complete regeneration of ovarian tissue in two ovaries upon which he had previously done a conservative operation. About three years ago, the speaker showed before the Brooklyn Gynecological Society an ovary on which he had done a conservative operation three months before. At the second laparatomy, he found that the ovary had completely regenerated, and was very cystic. This specimen, which he now presented, was an ovary which he removed last September. He had previously removed all but a very small and seemingly healthy portion of this organ. The present specimen showed that conserved ovarian tissue could regenerate. Dr. Hyde had removed all the cystic tissue that he could from ovaries which had been given to him by the pathologist. The apparently healthy portions remaining were then sectioned and photomicrographs were made of these sections. In all the pictures there was shown diseased ovarian tissue. The speaker did not advocate complete ablation of all cystic ovaries, but he believed that a patient is a great deal better off after complete removal of two badly cystic ovaries, unless for reasons of her own she wishes an ovary left. Of course, in nearly all so-called normal ovaries there were a few cysts.

Dr. Grad asked Dr. Hyde upon what he based his theory that ovarian tissue can regenerate. He did not see how true ovarian tissue could reform. He thought that a very careful microscopic examination would be necessary to decide that point. This little piece of tissue simply underwent some change.

Dr. Hyde stated that his only reason for making the statement was that there was a piece of normal ovary remaining. The specimen looked exactly like a cystic ovary, and he had used the term "regeneration of ovarian tissue" because this ovary appeared to have a true cortical layer. It seems, therefore, a regenerative rather than a degenerative process.

Dr. Emmet thought Dr. Grad's point was well taken. There could not be, so far as was known, a regeneration of ovarian tissue, but any development in its size was pathological, either in the form of hydrops of the follicles, and such were present even in infants and might enlarge at any time, or in hypertrophy of the fibrous structure.

Dr. Coe had never had any reason to believe that a small portion of the ovary would regenerate in the sense of reproducing normal ovarian stroma. If apparent growth followed, it was hyperplasia. He would regard the specimen as an example of de-, not re-generation.

Dr. Graves thought that the question of regeneration in the

ovary would depend upon whether there was a regeneration of the Graafian follicles which might be called the essential constituents of the ovary. He did not believe there was any such thing as a regeneration of follicles. It was possible for the stroma to become hypertrophied, as it might be demonstrated in certain forms of fibrous papillomata where the growth was in the stroma. In some of these cases the stroma of the papilloma exactly reproduced in appearance the unique structure of the ovarian stroma.

Dr. W. H. Baker read a paper entitled

REASONS FOR REMOVING THE VERMIFORM APPENDIX IN NEARLY ALL CASES WHERE THE ABDOMEN IS OPENED FOR OTHER LESIONS.

(See original article, page 240).

Dr. Bache Emmet said that his own view and practice was to remove the appendix, when operating in the abdominal cavity for other purposes whenever it is at all recognizably diseased, either by itself or in conjunction with the generative organs, whether inflamed or the seat of tuberculosis or malignancy, or attached to the broad ligament, ovary or tube, be it the primary cause of such involvement or a secondary sufferer.

When there is no evidence of disease or of its being engaged in that of neighboring organs, Dr. Emmet leaves it alone.

Its removal seems, in many cases, an unnecessary interference. In many instances it called for a much larger incision than the speaker was in the habit of making for ordinary pelvic work, and he knew that it was often difficult to find and draw it up, particularly when it lay behind the cecum, as it not infrequently does, owing to the failure of the cecum to make its complete turn during embryonic life.

Dr. Coe stated that when Kelly sent out his list of questions he had replied that while he had not yet adopted the plan of removing the appendix whenever the abdomen was opened, he was rapidly coming over to his opinions. During the past three years he had seldom varied from this practice, unless the condition of the patient was such as to forbid the spending of the extra five minutes necessary for appendectomy. He could cite several cases in which fatal complications resulted from leaving behind a diseased appendix, and others in which a secondary laparotomy was rendered necessary. One of the strongest arguments against vaginal hysterectomy (at least where there are many intestinal adhesions) was the fact that it does not permit removal of the appendix or show in what condition it has been left.

Dr. W. P. Graves said it was to be remembered that none of the cases reported by Dr. Baker, with one or two exceptions, represented what might be termed obvious appendicitis. The histories of the cases did not point to specific attacks, and the macroscopical conditions at the time of operation did not present the usual obvious appearances of acute or chronic appendicitis, for example, gangrene, enteroliths, adhesions, cicatrices, cystic dilatations, etc. Moreover, in only one of the cases was there any apparent connection between the

appendix and the pelvic condition for which the patient received operation. In order to make more clear the pathological lesions in these appendices, the speaker described in some detail Case 6 in Dr. Baker's list. This patient was a healthy girl of nineteen who came to Dr. Graves' out-patient clinic suffering only from a slight sense of weight and discomfort in the pelvis. She was found to have a complete non-adherent retroversion, and while waiting for an opportunity to enter the hospital for operation she was kept under observation. At one of her visits she spoke casually of a slight pain in her right side which she had felt for about thirty-six hours. Examination showed a slight resistance of the right rectus over the appendix region and a temperature of 99½°. She was taken at once into the hospital, where all symptoms subsided within a few hours. An abdominal operation was performed, the uterus being suspended and the appendix removed. The appearance of the appendix *in situ* was practically normal, with the exception of some injection of the superficial blood-vessels. Microscopical examination of the appendix showed the typical appearance described as acute catarrhal appendicitis. There was no change in the layers of the appendix with the exception of a very marked infiltration of polynuclear leucocytes in the mucosa and in the serosa together with the injection of the peripheral vessels. This case was described because it represented in a young woman the initial stage in the process of which the other cases occurring in older women mark a later development. The case was also instructive from a clinical standpoint in that it illustrated the mildest kind of an attack of appendicitis which the patient would hardly have noticed under ordinary circumstances, and even if it had been brought to the notice of a physician would probably not have been operated upon. The patient might be said to have just entered upon appendical life.

The other cases reported by Dr. Baker showed microscopic evidences for the most part of chronic inflammatory changes, many of them of long standing. The changes taking place in prolonged inflammations of the appendix were not particularly well classified, but they presented the following typical characteristics:

1. Appearance in the abdomen; the majority of these appendices proved to be what probably most were taught to consider about normal. They were free from macroscopical adhesions. Probably most of them would reveal to a perfectly trained touch a greater or less rigidity in the wall. There was usually an apparent injection of the superficial blood-vessels, but too much reliance should not be placed on this sign, because through a medium incision it was usually necessary, in order to bing the appendix into view, to put it on more or less of a tension and thus cause a certain amount of turgidity in the blood-vessels. In cases where the normal pale appearance of the appendix was replaced by a general suffusion, there was an unmistakable sign of inflammation.

2. Cross section of the appendices nearly always left the lumen

round instead of stellate in form, as had been pointed out by Dr. Kelly. This roundness of the lumen was due either to the stiffness caused by the increase of the submucous connective tissue or by the dilatation due to stagnant feces, or to both causes.

3. Microscopical appearance; the mucosa was always changed. In some cases it was thinned, the lumen being round and dilated. In other cases the mucosa and lumen might be completely replaced by cicatricial and granulation tissue. These two conditions might occur in the same appendix, the first representing a dilatation and the second a constriction. The mucosa when present was thickly infiltrated with polymorphonuclear leucocytes, usually of the eosinophilic variety. Plasma cells were also seen. The lymphoid tissue might be increased or decreased to complete disappearance, the increased condition probably representing an earlier and more acute stage of inflammation. The submucosa was always changed. Instead of being a somewhat slender, father delicate band of connective tissue, it became much thickened and densely fibrous. It was this also which caused a sense of rigidity, and, as Dr. Kelly had shown, prevented the appendix from emptying itself of fecal contents. The walls of the blood-vessels thickened, and there might be present leucocytes and plasma cells. The two layers of the muscularis were usually not changed excepting when thinned by pressure of fecal contents. The serosa always showed a thickened fibrous laminated structure with fine external adhesions. The blood-vessels and lymph spaces were choked with leucocytes and the subserous blood-vessels engorged with blood. In long standing or senile cases there might be complete obliteration, the entire appendix consisting mostly of fibrous tissue, all evidences of acute inflammation being entirely absent.

In these cases had been illustrated therefore a chronic progressive process in which there were sufficient evidences not only of a past inflammation but also of a present active one. There were significant signs of bacterial activity, and we might consider that while many of these appendices go on to complete cicatrization and immunity, yet there exists in them a slumbering fire which may at any time break forth and cause serious if not fatal results. The study of these cases convinced the speaker that the final complete involution of the appendix was the result of a long, progressive inflammatory change and, not as Ribbert and others have claimed, the normal and natural final stage of a functionless organ.

Since making the pathological reports on the cases which Dr. Baker had enumerated, Dr. Graves had examined as many more under like clinical conditions, with the same results. He thought himself justified, therefore, in drawing the following conclusions: "1. The majority of women operated on for pelvic troubles other than appendicitis have chronic appendicitis. 2. The great number of these inflammatory appendices are apparently independent of the pelvic condition. 3. The majority of the chronic appendices are accompanied by an acute catarrhal condition which causes the

chronic condition to be progressive, resulting eventually either in acute appendicitis or in the complete involution of the organ. 4. The presence of this active inflammation is a continual menace to the health of the patient. 5. It is therefore the duty of the surgeon to remove the appendix during any abdominal operation if the condition of the patient justifies such a procedure."

Dr. Cleveland said that Dr. Baker's views completely tallied with his own. He had been in the habit of removing the appendix in all abdominal cases where the condition of the patient would admit of the additional work, but never where it appeared dangerous to prolong an operation.. He made it a habit, immediately after opening the abdomen, to look for the appendix and anchor it by a thread of catgut, carried through the messooppendix at the distal end, clamping the ends of the catgut. He could then find the appendix at any moment. He was doing less of vaginal work, simply because he was thinking of the possibility of there being a diseased appendix, which could not be reached by the vaginal route. He had removed it a great many times, and had never seen cause to regret having done so. He had recently had a case where he removed the uterus for multiple fibroids and two tubo-ovarian abscesses, with the appendix involved in the mass, and apparently affected by the inflammatory conditions. The operation was a long one, and, as the patient was not in good condition, he did not dare to remove the appendix. He feared that he would hear from this appendix on account of its inflamed condition, but the patient made a good recovery, and it was now over a month since the operation, and he had not done so. Still, he would advocate the removal of such an appendix, where the condition of the patient warrants it. It was his rule to advocate the removal of the appendix in all cases, whether diseased or not. It was a useless organ, whose reason for existence has passed.

Dr. Bissell said it would be difficult for any man or group of men to claim priority to the operation of removing the appendix, normal or abnormal whenever the abdomen is opened. But those who held this view five or more years ago might maintain a certain pride in finding the majority of surgeons now with them. In a paper read before this body, a few years ago, the speaker had reviewed some of the work done at the Woman's Hospital during the years 1901-2, and wrote of appendectomy in the following language: "It was our custom to examine the appendix in every case where time would allow. If the organ was found to be appreciably diseased it was always removed; if not diseased, we also removed it, provided in so doing we did not unnecessarily prolong the operation. Removing the organ when not diseased we considered justifiable because it insured the patient against the possibility of a painful and dangerous affection and the additional operation, being minor, adds but little to the danger of the primary operation."

Of the twenty-four appendectomies then reported, twenty-one were with associated diseases. In the majority of cases the ap-

pendices were normal. The median incision was also advocated when operations were upon women, since the pelvic organs were frequently found involved as a result of inflammatory action in the appendix; this route gave the best opportunity for complete work in both regions.

Dr. Goffe said that neither his experience nor his study of the subject has led him to adopt this method of procedure. He did not believe in removing the appendix when it is not diseased. The argument was, of course, negative. The histories showed that these women did not suffer from appendicitis; they gave no history or symptoms pointing to that organ. In spite of this fact, it has been removed. He claimed that it was going beyond what was legitimate. Dr. Coe had cited a case in which the patient died the day after the operation from a complicating appendiceal trouble, but that the appendix was attached to the tumor. He himself had said that its end was injured. In that case there was a pathological condition connected with the appendix. The speaker's position was that in all cases where the organ was found diseased it should be removed, but if not diseased it should be left alone. The function of the appendix was unknown. For a great many years no one had the least conception that the thyroid gland was of any importance whatever, and yet it was now known to be one of the most important glands. Some German investigators had claimed that the appendix has a physiological function. Unless diseased it gave no trouble, and therefore unless diseased no man had any right to interfere with it. Dr. Cleveland had cited a case in which the appendix was intensely inflamed, and it had never given any trouble. Was any one present who had had a case in which the appendix was examined and found healthy at the time of the operation, and had subsequently required operation for appendicitis?

Dr. Broun replied that he could, unfortunately, report two cases of appendicitis. In both patients the operation was primarily done by the vagina for pelvic disease. In both instances I found it necessary to remove the diseased appendix at a subsequent operation.

Dr. West had operated upon a woman last June and carefully examined the appendix. It seemed perfectly normal, and at that time he did not remove it. Last week he operated for appendicitis.

Dr. H. Grad asked permission to report a few illustrative cases, bearing on the subject of removing the vermiform appendix when the abdomen is opened for other lesions than appendicitis. He said: "The subject has been widely discussed, and unanimity of opinion obtained as to the following points: That the appendix should be removed (1) if the naked eye appearance of it deviates from the normal; (2) if on palpation concretions are discovered in its lumen; (3) if the organ is hard and thickened; (4) if its mesentery is short, which may cause kinking of the organ; (5) if it is adherent; (6) if its position is faulty; (7) if it is excessively

long; (8) or if the patient is suffering with prolapsed kidney, which may subject the organ to traumatism. Those who oppose the removal of a normal appendix argue that the removal of a normal organ is foreign to modern surgery, and also that the organ may be the seat of some internal secretion; furthermore that the removal of even a normal organ may add an element of danger to the abdominal operation. That the removal of the appendix prolongs the time of the operation is also given as an argument against the amputation of a normal organ. The last objection is a potent one. In abdominal operation the element of time is an important factor. If the patient's general condition has materially suffered as a result of the operation, the surgeon's aim should be to terminate the operation speedily, and not to burden the already overtaxed recuperative powers of the patient by prolonging the operation in searching for the appendix. If the patient's general condition is good, the surgeon may perform a great service for the patient in removing the appendix before closing the abdomen.

"The most important argument the opponents of the prophylactic removal of a normal appendix can present is the fact that the removal of a normal appendix *per se* has a mortality rate, as the best available statistics of the so-called 'interval operation' show. As the 'interval operation' implies a normal general condition of the patient, it does seem that the mere removal of a normal appendix is attended with a certain amount of risk, low as the mortality rate may be. Admitting this low mortality rate, the question arises, is it justifiable to remove a normal appendix and subject the patient even to this extremely slight risk? Accidental infection of the surrounding tissues and stump of the appendix during the amputation of the organ and manipulation of the parts may account for some of the fatalities in the simple removal of the appendix. Even those surgeons who claim that with proper precautions infection of the structures and stump of the appendix during the act of the manipulation of the organ can be prevented, must admit that one can conceive of the possibility of such an accident. I have met with such an unfortunate occurrence once. I have reason to believe that the source of the infection in that fatal case was the appendix. In reporting this case the propriety of drawing conclusions from it may be questioned, because I have no absolute scientific data at hand to fortify my contention. I am convinced in a measure that the infection in that case occurred during the removal of the appendix. Had I been less zealous in removing the organ the outcome of the case might have been different. My zeal, however, was in a measure pardonable, because certain subjective symptoms presented by the patient pointed to an offending appendix.

"Is there a medicolegal aspect to the question at issue? Is the surgeon obliged to obtain the consent of the patient to the removal of a normal organ, before the operation, in order to legally protect himself, and would the courts uphold the surgeon, claiming

that in removing the normal organ he has acted solely in the interest and future benefit of the patient?

"The report of the following cases is made because they are in a measure illustrative and germane to the question under discussion.

"CASE I.—Patient, 27 years old, had one child four years ago. Never had any acute abdominal symptoms. For the past six months she had been conscious of enlargement of the lower part of the abdomen, and suffered with pelvic distress, backache, and bearing-down pains. Bimanual examination revealed a pelvic tumor, completely filling the true and false pelvic, rising half way up to the umbilicus. The cervix pointed upwards. The tumor and fundus uteri seemed one mass. On opening the abdomen the neoplasm proved to be a multilocular ovarian cyst, which pressed the uterus into the hollow of the sacrum, itself resting on the organ. After removing the cyst it was found that the opposite ovary was also the seat of an ovarian cyst, which was then ablated. Before closing the abdomen, search was mde for the appendix, and I found its free end inflamed. The inflammatory infiltration caused clubbing, and the organ also harbored a concretion. The appendix was removed, the patient making an uneventful recovery.

"In this case the search for the appendix before closing the abdomen was a fortunate circumstance, because, with so much inflammatory disturbance in the organ, it would have been only a matter of time before the patient would have suffered an attack of appendicitis. This case illustrated to my mind the advisability, nay, the necessity, of looking at the appendix when the abdomen is open and opportunity offers itself.

"CASE II.—This patient's condition impressed me greatly with the advisability of removing the appendix when the abdomen is open, if the patient's condition is such as to admit of an additional operation. The circumstances of the case were the following: On June 14, 1900, a right salpingo-oophorectomy was done on this patient through a medium laparotomy incision. The much tumefied tube and diseased ovary were firmly adherent to the posterior wall of the uterus and broad ligament and the adhesions were separated with great difficulty. This necessarily left a large raw surface on the posterior wall of the uterus. The left uterine appendage was normal except for a cystic condition of the ovary. Conservatism was practiced on the organ, and the cystic portion resected. The appendix was examined and found absolutely normal. An uneventful recovery followed, but the patient remained well only for one year. She then began to have attacks of pain in the lower part of the abdomen, so severe as to call for the administration of morphine. These simulated attacks of appendicitis, but no pain was elicited by pressure over McBurney's point, or anywhere in the right lower quadrant of the abdomen. It was, however, caused by pressing the region to the right of the uterus. As the right appendage had been removed, it was difficult

to account for the sensitiveness of this region. Soon after a severe metrorrhagia made its appearance, with a palpable mass to the left of the uterus. The metrorrhagia resulted in severe anemia, and the patient became on invalid. On July 8, 1902, or just two years after the first laparotomy, the abdomen was re-opened. After separating a few adherent coils of intestines it was found that the appendix was firmly adherent to the posterior wall of the uterus. The appendix was thickened and considerably inflamed. As far as the naked eye could see, two years before, this organ was absolutely normal. The probabilities were that the appendix having rested against the raw uterine surface left after the salpingo-oophorectomy, had become adherent and later inflammatory changes had set in. The appendix was removed, together with the left uterine adnexa, with rapid recovery of the patient. Had this appendix been removed at the first operation, the patient would have been spared great suffering.

"Case III illustrates still more emphatically that the removal of the appendix, when the abdomen is opened for lesions other than appendicitis, may confer a great boon to the patient and may save them from subsequent attacks of appendicitis. A prominent surgeon of this city operated on this patient in 1896 for unilateral pyosalpinx, removing the offending left tube by a vaginal incision. The recovery of the patient from the operation was prompt, but no symptomatic recovery followed. Pelvic pain persisted. Menses irregular and excessive. Examination showed that the uterus was retroverted and left appendages were very tender. After suffering for two years the patient was subjected to a laparotomy by a well-known gynecologist. On opening the abdomen the remnant of the left tube was found adherent to the vaginal scar. The ovary was enlarged and imbedded in a mass of adhesions. The uterus was liberated from its bed of adhesions, conservatism practiced on the right appendage, and ventral suspension of the uterus performed. Before closing the abdomen the appendix was examined and pronounced normal. Recovery was speedy and the patient was relieved of the pelvic pain and metrorrhagia. She remained well for fourteen months. On July 6, 1902, while in the mountains, the patient was taken with a sharp attack of pain in the right lower quadrant of the abdomen. On July 10, 1902, a telegram announced her medical attendant's opinion that an immediate section for appendicitis was necessary. The next day I found the patient well enough to return to the city. She stood an eight-hour journey well, but had a severe attack of pain the day after, pulse 80, temperature 99.5°F. Leucocytosis 12,000. On July 14 a median incision along the old scar was made. The appendix was found markedly engorged, very long, and filled with fecal matter to such an extent as to make the organ feel like a cord. Had the excessively long appendix been removed at the time of the operation, fourteen months before, the patient would have been spared an attack of appendicitis and much suffering.

"Case IV.—In this case I have reason to believe a fatal infection started in the stump of the appendix. The patient was single, 27 years old. Four years previously she had been operated on by me for a large pelvic abscess, which was drained by a vaginal incision. The etiological factor of this pus collection was not quite clear, but as I could exclude gonorrhea and pyogenic infection from external sources, she being a most estimable young woman, I concluded that the source of the infection was the appendix. A good recovery followed the evacuation of the pus, and the patient enjoyed good health for two years. She then began to complain of general pelvic distress and dysmenorrhea. Bimanual examination showed a mass to the right of the uterus, which was very tender to the touch. On the supposition that the pelvic abscess two years ago had been of appendicular origin, her present disturbance was attributed to the same cause. Abdominal section revealed the error of the diagnosis. The appendix was exceedingly long. The free end pointed upward, towards the liver, the meso appendix was short and narrow. The organ was quite inaccessible for removal through a median incision. The pathologic state in the pelvis was due to a diseased uterine adnexa. The ovary was much enlarged, and firmly adherent to the vaginal scar of the previous operation, demonstrating that the pelvic abscess was of ovarian origin. The tube of the corresponding side was attached to the ovary by numerous adhesions, and after some difficulty both were removed. Although the appendix was found normal and quite inaccessible, it was deemed best to amputate it, because of its length, and because, on various occasions, the patient had complained of ill-defined pain in the right lower quadrant of the abdomen. A slight accidental soiling of the stump of the organ took place in the act of the amputation. The matter was not given serious thought then, but I believe the fatal infection occurred at that time. In the removal of the appendix the Dawbarn method was used. The patient left the operating room in as good condition as any laparatomy case ever does. Twelve hours later there was a rise of temperature, and twenty-four hours after the operation the patient presented marked and unmistakable symptoms of general peritonitis. On removing the dressing it was found that the edges of the incision were inflamed and a sense of cracking was imparted to the touch. On consultation it was agreed that a bowel perforation must be present, and that the emphysematous state of the wound was due to this. This diagnosis, I believe, was erroneous. I reopened the abdomen, and sought for the cecum to search for a bowel perforation or possibly a reopening of a faultily secured stump of the appendix. On bringing the caput coli into view it was found that the bowel walls were intact, but that the cecum was emphysematous, somewhat infiltrated and markedly congested, with here and there the presence of a gas cyst. There was a general peritonitis. Examination of the pelvis was negative, the stump of the adnexa appeared to be in good condition. The case was apparent-

ly one of bacillus aerogenes capsulatus infection. I have no scientific data at hand to fortify my diagnosis, but the clinical evidence points strongly to that type of infection.

Since Welch described the organism in this country, many reports of fatal infection with this bacillus have been reported. Not all of the cases infected with this oragnism proved fatal. A case is recorded by Loeb (*Amer. Med.*, 1901, p. 137) where recovery took place after a very severe infection with this bacillus. He says: "Altogether, about 60 cases of emphysematous gangrene due to the gas bacillus have been reported. Of these, about one-half terminated fatally. Of the other half, in a large majority of cases either the symptoms were mild throughout, or recovery followed an early amputation of the limb." In reference to the bacillus aerogenes capsulatus, Welch says (*Phil. Med. Jour.*, 1900, page 212: "The intestine is by far the most common source of the gas bacillus, found together with gas bubbles in the blood and organs at autopsies. This invasion may occur either with or without definite intestinal lesions, and is probably in a majority of cases an agonal or post-mortem event." Again I quote from his lecture: "One of the most interesting lesions produced by bacillus aerogenes capsulatus is the formation of submucous or subserous gas cysts or blebs. My list of cases includes 25 instances of this condition. These gas cysts vary in size from microscopic dimensions to large blebs. They are most common in the submucous coat, but may be present in the mucous membra-muscular coat or beneath the serous covering; in fact, in any part of the membranous wall. They may be few or in enormous numbers, in groups or scattered. In one of our cases the whole small intestine from the duodenum to the iliocecal valve was studded with small gas cysts." duodenum to the iliocecal valve was studded with small gas cysts. "All the instances of submucous and subserous gas cysts in my list were observed post-mortem." He says further: "It is, with our present information, a difficult matter to say in how many of these cases the emphysematous state existed before death. It is certain that at least in a great majority of cases in my list the emphysema was not the result of ordinary post-mortem decomposition. In a large number of cases the autopsy was made within a few hours after death." Further on in his lecture he makes the following remarks: "The only instance in which gas cysts of the human intestine have been recognized during the life of the patient is reported by Hahn, who found them in large numbers on opening the abdomen. It is to be regretted that no thorough bacteriological examination of this case was made."

I regret indeed exceedingly not having had my suspicion that the infection in this case was due to the bacillus aerogenes capsulatus verified by bacteriological investigation. I do not know, indeed, if I am drawing justifiable conclusions, but the virulence of the infection, the patient passing from comparative health to a state of profound sepsis within a space of twenty-four hours, and

the localized emphysematous condition of the caput coli, make me think that I was dealing with a case of infection with this bacillus.

In conclusion, I freely admit a great shortcoming in making this report. I am conscious of a lack of a scientific spirit, and yet the facts in these cases appear so clear that I cannot help drawing certain conclusions from them. Hippocrates says: "Experience is fallacious and judgment difficult," and yet nothing else but experience and judgment have we to fall back on. Fortified thus, I believe we serve our patients well in removing the appendix when the abdomen is open and the condition of the patient is favorable, so that a slight delay in ending the operation will not jeopardize a favorable issue of the case. Theoretically, there ought to be no such thing as accidental infection, but can the endeavor of the finite count against the infinite; is not the whole greater than the part? Dr. Baker, in closing the discussion, said he was glad that Dr. Cleveland called attention to the advantages to be derived from securing the appendix early in any abdominal operation, and leaving its removal until just before closing the abdomen. He had also found that it was much more accessible before the patient had been in the Trendelenburg position for any length of time. He thought that Dr. Goffe and himself were not as far apart in their opinion as would be inferred from the former's remarks. It seemed to be rather a difference of standard of what constitutes a diseased appendix. Dr. Goffe would, no doubt, agree to the rule to remove all diseased appendices, while the report of the speaker's cases would prove that in three-fifths of the diseased cases the existence of such a condition cannot be determined by the gross appearances, but only by the pathologist's microscopical examination. The proofs which Dr. Grad had given, in the specimens accompanying his reports of cases, had been most pleasing and conclusive. H. GRAD, Editor.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Operations for Radical Cure of Hernia in Children.—The results of 1,500 operations for radical cure of hernia in children, all but 20 under 14 years of age, are published by W. T. Bull and W. B. Coley (*Med. Rec.*, March 18). They are from the Hospital for Ruptured and Crippled from December, 1891, to October, 1904. They state it has been their custom to treat hernia in children, with certain exceptions to be noted, for a period—usually one or two years—with a truss, before advising operation. If at the end of this period no improvement is observed and the rupture frequently comes down, an operation is advised. The operation is advised, furthermore, when the following conditions exist, without any reference to truss treatment: 1. Strangulated hernia, or cases in which strangulation has occurred or reduction has been

effected by taxis 2. Hernia with reducible hydrocele, or fluid in the hernial sac. 3. Irreducible hernia (rare in children). 4. Femoral hernia, which is practically incurable by truss treatment. In cases under four years of age they seldom advocate operation, since the chances of a cure by truss treatment are far greater in young infants. As mortality has been practically eliminated, and results are uniformly successful, they now advise operation in most cases of hernia in children over four, unless the hernia is very small, especially if it is difficult to secure proper application of the truss at home. About two-thirds of infants under two or three years are apparently cured by truss treatment. Inguinal hernia in the female was treated, by an operation identical with Bassini's, without the transplantation of the cord, 251 times in 217 patients, with no relapse. In the male Bassini's method was usually employed, without excision of any of the veins of the cord. The favorable results, and the atrophy of the testicle which others have noted after excision of the veins, prove that such excision is unnecessary in children. Femoral hernia was treated in 39 cases, usually by high ligation of the sac with a purse-string suture of kangaroo tendon, without a relapse. The importance of freeing the femoral canal of all fat is strongly emphasized. In 85 cases an undescended or partially descended testicle complicated the operation. The writers advise against operation in such cases in infants and children up to 8 or 10 years, unless the hernia is large, as the testis often descends of itself if no truss is applied. Strangulation is not likely to occur, as the testis prevents the intestine from passing the external ring. After operations the testis remained in the scrotum and developed in size in some cases; in the majority, it remained more or less atrophied. The writers believe in preserving it, nevertheless, as it may have great influence upon the development of the child, especially in sexual characteristics, even if functionally useless. In 13 cases of strangulation this was always to constriction by the external ring. Practically all cases of umbilical hernia in children under 12 to 14 years may be cured by mechanical means, such as pressure by a wooden button mold covered with and held in place by zinc oxide adhesive plaster, changed every one or two weeks for about a year. After 1,076 Bassini operations there were 6 relapses, and 5 in 125 in which the cord was not transplanted. The majority of relapses after any operation for hernia occur during the first six months, and 90 per cent. during the first year. In the 1,500 operations there were 4 deaths, a mortality of less than three-tenths of 1 per cent.

Pneumothorax Complicated by Asthma of Kopp-Millar.—G. Carrière (*Le Nord Médicale*, April 1) calls attention to the rarity of pneumothorax in infants. In 5,394 children seen at the Children's Clinic at Lille, only 2 cases of pneumothorax were observed. One of these was in a tuberculosis of the second stage. The other occurred in a child, otherwise healthy, who at eight months of age began to have attacks of spasms of the glottis, or Kopp-Millar's

asthma. These occurred about once a month until the child was 14 months old. They would last for half a hour or more, and then pass away. They were characterized by the symptoms of asphyxiation, coming on suddenly, and passing away slowly. After one such attack the respiration remained rapid, cyanosis persisted during the entire night, and when the child was brought to the clinic it was in a very serious condition. All the accessory muscles of respiration were in action, but the left half of the thorax did not join in the respiratory movements at all. The vibrations were diminished, the resonance exaggerated, the respiratory sounds feeble, expiration much prolonged. The author diagnosed pneumothorax, coming on suddenly after an attack of spasm of the glottis, from the stretching and rupture of the lung tissues, giving free access of air to the pleural cavity. He opened the thorax. The child was at once relieved, and made a good and rapid recovery.

Cerebrospinal Fever.—Charles G. Stockton (*Albany Med. Ann.*, March) concludes, from a review of the literature and from his own observations, that in the treatment of cerebrospinal fever the most useful procedure is the bringing about of the best hygienic condition for the patient; that is to say: first, absolute quiet in well ventilated, darkened rooms, with the absence of all excitement and irritation; second, giving the greatest attention to secure the proper performance of the various functions of the body; third, the trial of the hot baths after the method of Aufrecht in all cases where they seem to do good; fourth, the practice of intraspinal puncture, with drainage where necessary to relieve severe pressure symptoms, to be repeated, if necessary, provided benefit follows the first puncture; fifth, the use of antipyrin in cases in which the temperature is raised, not only for the relief of this symptom, but for the mitigation of headache and hyperesthesia. Personal experience has shown the writer that the drug is also useful in improving the mental state, and it has not been followed, in his hands, by the expected depression; sixth, the use of opium or the bromide alone, or in connection with antipyrin, if necessary for the relief of convulsions, pain, hyperesthesia, and pressure symptoms generally, which are not relieved by the foregoing methods of treatment; seventh, the use of mercury when needed for its laxative effect, or needed to assist in stimulating the organs of elimination.

Edward Waitzfelder (*Med. Rec.*, March 11) has tried the injection of diphtheria antitoxin in 17 cases of epidemic cerebrospinal meningitis with the following results: 5 complete recoveries; 3 deaths, including 2 adults; 9 still under treatment, 5 of whom were apparently recovering. He believes that a larger dose of antitoxin is necessary than is usually given in diphtheria, and that it should be repeated daily until urgent symptoms abate, not excluding lumbar puncture if symptoms of cerebrospinal pressure are present. With the subsidence of cerebral symptoms, the dosage should be decreased, but the treatment continued at longer

intervals until all central nervous symptoms have disappeared. This treatment has also been tried at the New York Hospital, but without the favorable results claimed by Waitzfelder.

A. Chauffard (*La Presse Médicale,* May 6) discusses epidemic cerebrospinal meningitis with reference to differential diagnosis from the other forms of meningitis, etc. The diagnosis is to be made by the combination of symptoms, which include hypertonicity of the muscles of the dorsal plane, *i.e.* rigidity of the neck and back, of extensors of the upper extremity, and of flexors of the lower extremity, with abolition of the patellar tendon reflex, fever, headache, paralyses, herpes. In hemorrhagic meningitis there are no marked fever, herpes, and signs of general septic infection, and meningococci are not found in the cerebrospinal fluid. The presence of the diplococcus of Weichselbaum is the best differential sign. The cerebrospinal fluid also contains much albumin and polynuclear leucocytes. The author remarks the morphological resemblance of the diplococcus of meningitis resembles the gonococcus in form, dimensions, intracellular location and staining properties. Their cultures are similar; their toxins are comparable, and both have an extraordinary virulence toward laboratory animals. These microbes were, perhaps, identical in origin, but differ as they have become adapted by location in different tissues. The meningococcus penetrates to the meninges not by way of the blood, but through the nasal fossæ. Epidemic cerebrospinal meningitis is often preceded by a coryza. The malady has been reproduced in animals by injections into the nasal fossæ of fluids containing meningococci. These organisms pass through the lymphatic channels into the subarachnoid spaces by way of the cribriform plate of the ethmoid. Perhaps the pneumococcus and the tubercle bacillus reach the meninges in the same way. Hence, bacteriological examination of the secretions of the nasal fossæ of persons in the family of the patient may be of use as a prophylactic measure. The victim of the disease is always polyuric, and there is increase of uric acid and phosphates, while chlorides vary. As to the prognosis, it depends on the general condition, action of the kidneys, and presence or absence of complications. A marked herpes is a good sign. A simple meningitis without complications will recover well; if accompanied by cerebral, spinal, or nerve complications, the probability of entire recovery is less. The only therapeutic measures of use are hot baths, at 38°-39° C., which have a sedative as well as a diuretic action, and lumbar puncture. The latter procedure calms the nervous and head symptoms, by diminishing the tension of the cerebrospinal fluid, or by removing a certain amount of toxin. It may be repeated two or three times on successive days. It increases the changes in the polynuclear leucocytes as well.

Concerning the communicability of cerebrospinal meningitis, E. M. Buckingham (*Bost. Med. and Surg. Jour.,* Apr. 20) says that in eight years 110 cases were treated in the general medical wards, there being at one time 16 in the ward. They were mingled with

the other patients from admission to recovery or death, yet no case has ever originated in the hospital among patients or attendants. The writer has exercised care in disinfection of his hands and of articles which may have been soiled by fluid from lumbar punctures, and the assistants presumably did the same. These observations show that merely living in the room with cases of cerebrospinal meningitis is not dangerous and that some other mode of transmission must be sought.

Diphtheria.—J. F. Biehn (*Clin. Rev.,* Apr.) demonstrates the uncertainty of clinical diagnosis of diphtheria by presenting the results of examinations of cultures in the municipal laboratory of Chicago during the past year. Of 364 cases diagnosed, clinically, as diphtheria, only 135 or 37 per cent. contained diphtheria bacilli. Unfortunately the error is not always on the safe side, as is shown by the fact that of 416 cases diagnosed clinically as tonsillitis, 68 or 16.34 per cent. did contain diphtheria bacilli. Ten per cent. of the latter showed no membrane. In virulent throat cases causing death within 24 to 48 hours, and many cases of rhinitis a membrane is usually not found. Only 1 per cent. of normal throats ever show diphtheria bacilli. In 56 cases of diphtheria examined, the shortest time that the bacilli persisted in the throat after disappearance of the membrane was 7 days; the longest, 8 weeks. The time is usually 2 to 4 weeks, at least, whether antitoxin is given or not. The use of antiseptics in the nose and throat during convalescence is important, as is disinfection of the rooms and contents as the bacilli resist drying 3 or 4 weeks.

Treatment of Diphtheria.—J. T. C. Nash (*Practitioner,* April) emphasizes the importance of early administration of antitoxin. He would give 2,000 units subcutaneously as soon as a suspicion of diphtheria is entertained, and a second injection of the same amount if this is confirmed. Strychnine he regards as second only to antitoxin in value if given in sufficiently large doses. It is the physiological antidote of the diphtheria toxin. The author sometimes gives nearly half a grain a day, in divided doses, to children, reducing the quantity after a few days. In the early days, the writer employs strychnine with the euchlorine mixture of Burney Yeo. A few days later this is changed to tincture of chloride of iron with strychnine. Color and pulse rate are the chief guides in determining the length of stay in bed after disappearance of symptoms. The diet varies according to the case. With much soreness of the throat, and in the early days, milk diet with beef tea and an egg beaten up is indicated. Ordinary diet may usually be resumed in three or four days. Cases treated early with antitoxin do not develop albuminuria. This contraindicates the use of potassium chlorate in the euchlorine mixture, but not a dietary including one egg. Raw meat juice is very valuable. For complicating paresis nothing else compares with large doses of strychnine. Tracheotomy ought never to be performed until antitoxin has been given time to act.

M. Aramian (*Med. Rec.,* March 4) believes that extract of

dichondra, a solution of which, in three parts of glycerin, he calls antidiphtherin, has a specific bactericidal action against the bacillus of diphtheria. He claims that it completely destroys these bacilli, usually within two to five days, without local irritation, and that it may be swallowed with impunity, having no toxic qualities. He says that success is complete when all bacilli can be reached by the local application, but that when this is impossible antitoxin should also be employed. The drug is an extract of the seeds and stems of *Dichondra brevifolia.* Used internally it is slightly laxative and diuretic. It is applied to the throat, nose, or larynx in diphtheria with a cotton swab, and no food or drink is allowed for at least half an hour. This is done at least three times a day in light, and at least six times in severe cases, and continued until all redness of the affected membranes disappears and bacteriological examination is negative. The treatment has been employed by the writer in 53 private cases, with 2 deaths; of these, 27 were cured by the drug alone, the others with antitoxin also. The paper includes a few case reports by other physicians which showed rapid disappearance of the bacilli.

J. D. Rolleston (*Practitioner,* May) discusses the nontherapeutical sequelæ of administration of diphtheria antitoxin which he has observed in 600 cases. Three types of rashes occur: A scarlatiniform, localized or general, usually within a few days after the injection and commonly limited to the site of the latter; an urticarial, generally on the seventh or eigth day after injection, appearing on the abdomen close to the site of the puncture and becoming general; circinate erythema or secondary rash. The last usually appears between the tenth and eighteenth days; is first amorphous, then circinate, with pyrexia, pains in joints, muscles or fasciæ, and adenitis of the submaxilliary and cervical nodes, rarely of the axillary and inguinal also. Abscesses may occur at the point of injection, and hyperidrosis is common. The urticarial rash may be relieved by an ointment of menthol ℈i in albolene ℥i. Carbolic lotions and opium preparations do not give good results. For joint pains, local applications of belladonna. The urine is regularly reduced for two or three days. Concerning the prognostic value of these sequelæ the writer says that a skin which remains dry after repeated large doses of antitoxin is characteristic of a severe attack, and is often followed by absence of other serum phenomena and by onset of early and fatal paralysis. The appearance of a secondary rash and its concomitant symptoms is an excellent augury as regards the life of the patient.

Scarlatinoid Metadiphtheria.—A. E. Marfan (*La Presse Médicale,* April 29, 1905) describes the eruptions of so-called scarlatinoid form that complicate diphtheria, and their differential diagnosis from serum eruptions and true scarlatina. The scarlatinoid eruption is very similar morphologically to the scarlatina rash; there is the coexistence of a red angina, with, perhaps, a puriform exudate, a thermic cycle almost the same, frequently initial vomiting and secondary suppurations. On the other hand,

the eruption of metadiphtheria does not always develop according to the same laws as that of true scarlatina; it may not generalize as regularly; the roughened character of the eruption is less; the tongue does not desquamate, nor is it so red as to give the strawberry appearance of true scarlatina; the desquamation of metadiphtheria is slight, branny, and absent on the extremities. In diphtheria treated by serum the scarlatinoid eruption occurs more often in malignant cases, or those of submalignant form, than in ordinary cases or in croup. It occurs late in the disease, from the eighth to the twelfth day, hence usually in cases that will get well. It comes on suddenly, with sharp rise of temperature, like a complication. It may begin where the serum was injected, or on the dorsal surface, or upper thorax, never on the face, and is only slight on the limbs. The tonsils are enlarged, and civered with puriform secretion. The glands are enlarged and slight albuminuria occurs. It subsides rapidly. True serum eruptions are urticaria, local erythema, and macular, or papular, eruptions accompanied by pains in joints and muscles. All these symptoms may occur in preventive inoculations in healthy subjects, also in injections of simple horse serum, hence there is not the effect of the antitoxin, but of the heterogeneous serum. The scarlatinoid eruption is not due to the serum, for it is never observed in preventive injections into healthy persons; it was described before the discovery of antitoxin, and precipitines are never found, such as result from the use of serum. It is due to a true infection secondary to diphtheria. The author believes that the ordinary methods of diagnosis will not separate scarlatinoid eruptions from a typical case of true scarlatina. The date of appearance is not sufficient, and a sure diagnosis cannot be made clinically. Neither can it be made by blood examinations, because the microorganism of scarlatina is not certainly known. The author inclines to the opinion that scarlatinoid eruptions are really manifestations of scarlatina, modified by the presence of diphtheria and by the serum treatment, hence he isolates every such case that appears in the children's pavilion. These cases are much more rare now than before isolation was adopted.

Spastic Diplegia Following Pertussis.—J. H. W. Rheim (*Jour. Amer. Med. Assn.*, March 4) records the history and autopsy findings of the following case: A child of 21 months developed, during an attack of pertussis, a spastic diplegia, with, finally, imbecility and general convulsions, and died at the end of 17 months. A study of the brain and spinal cord revealed the presence of numerous small microscopic hemorrhages, distention of the perivascular spaces with cellular accumulation around the vessels and the presence of large mononuclear cells surrounding these spaces and elsewhere in the cortex of a paracentral region. The pia was in places thickened and the seat of a cellular infiltration. The motor tracts were diseased from the internal capsule to the lumbar cord, staining either poorly or not at all by the Weigert stain. Acute degeneration was observed in the cortex and one of the

peduncles, as shown by the Marchi method. The lesions were those of hemorrhagic encephalo meningitis. The paper includes a review of the literature of nervous manifestations during the course of pertussis.

Etiology and Pathology of Bronchopneumonia Complicating Measles.—In view of the fatality of this complication of measles, Chas. F. Craig (*Jour. Amer. Med. Assn.,* Apr. 15) has made a study of 89 cases of measles treated, during a recent epidemic, at the United States Army General Hospital at San Francisco. In 13.5 per cent. of these bronchopneumonia developed, and nearly 84 per cent. of the latter terminated fatally. The cases were all in men 21 to 30 years of age. From a summary of the macroscopic and microscopic pathology of the organs from these cases of bronchopneumonia it is evident that the infection was of a septic character, producing very severe and rapidly fatal lesions in the organs mentioned. These lesions were hemorrhages in all the organs, areas of focal necrosis, hyaline degeneration, empyema, and abscess formation in the lungs, kidneys, and spleen, and the presence in the capillaries of the liver and kidney, and in the air vesicles of the lung, or large numbers of lymphoid cells. The writer concludes that this epidemic of bronchopneumonia complicating measles was due to secondary infection of the diseased mucous membrane of the respiratory tract by streptococci, with consequent production of a bronchopneumonia associated with a pyemic infection due to these organisms.

Typhoid Fever in Infancy.—To the literature of this subject Otto Grünbaum (*Brit. Jour. of Children's Dis.,* Apr.) contributes an analysis of 36 cases treated in the London Hospital during the last two years. The most striking point was the short duration of the pyrexia, the average being eleven days after admission into the hospital. Diarrhea was noted in 5 cases, while a history of the same complaint before admission was obtained in 10, though not improbably this was somewhat influenced by use of home remedies. The characteristic lassitude was often absent. Distention of the abdomen was present in all but two cases. The spleen was felt below the costal margin in 17. Spots were observed in 21, and bronchitis in the same number. There were no relapses. The point emphasized is the frequent mildness of typhoid fever in infants and the difficulty in diagnosis. For this reason the writer would consider all doubtfull cases as infectious and treat them accordingly.

Dissemination of Streptococci Through Invisible Sputum.—This subject has been studied by Alice Hamilton (*Jour. Amer. Med. Assn.,* Apr. 8) in relation to scarlet fever and sepsis. She says that streptococci are expelled from the mouth to a distance of at least 36 centimeters, in the invisible droplets of sputum by coughing, speaking, whispering, crying, or breathing forcibly through the mouth. Thirty-three out of 50 scarlet fever patients, mostly children, were found to expel streptococci in coughing, crying, or

breathing; 42 out of 50 normal adults did so in coughing or in speaking. These streptococci may be inhaled by others or may enter wounds during operations, thus causing suppuration. As the virulence of an individual strain of streptococcus may be raised by planting on certain media or by passing through susceptible animals, so probably it may be raised by passage from one individual to another. In this way may be explained the conversion of a case of simple scarlet fever into one of scarlatinal sepsis; and in the same way, cases of surgical sepsis occurrring after all usual precautions have been exercised. Cases of scarlet fever with streptococcic complications should be isolated from cases without such complications. Surgeons and nurses should have their mouths protected during operations.

Late Rickets.—The case recorded by R. W. Marsden (*Edin. Med. Jour.*, Apr.) gave no family history of similar trouble. Since birth she had been small and under-developed. In infancy she had a large abdomen, diarrhea, vomiting, and very offensive stools, but no bony deformity. First tooth cut at 8 or 9 months, last at 3 years. Sat up at 6 months, crawled at 15, but could not walk until 2 years. She would eat any amount of meat she could obtain, and table salt by itself, but no vegetables. When 18¼ years old she seemed much exhausted after a long walk, and thereafter was easily fatigued by walking. Two months later she began to have pains in the legs, afterwards in the arms and back. At 18½ the ankles and knees were swollen; the left leg began to bend inwards at the knee, and soon after the right bent outwards, and the wrists became swollen. At 18¾ years she showed the general development of a child of ten or twelve, except the breasts, which appeared normal. The teeth were extremely irregular; the long bones showed the characteristic enlargements of rickets, with gnu valgum on the left side and genu varum on the right. The extremities showed great tenderness, and the muscles were very weak. The case is most unusual in that the active signs appeared so late in life. A marked alteration observed was in the excessive width of the epiphyseal cartilage, which, instead of being about one-twelfth of an inch across, were at least five or six times as broad. The writer thinks that the measurement of this cartilaginous zone, with the aid of the *x*-ray, may be a reliable test for the diagnosis of rickets. As to whether rachitic manifestations are ever visible for the first time in later years, there are three possibilities: that it occurs at the later period in life in an individual previously healthy; that an attack of rickets in infancy does not completely subside and a relapse occur; that the infantile rickets may be entirely recovered from, and after a variable period of normal growth a recurrence take place. The writer thinks that even apparently primary late cases may in future be shown to have exhibited previous rachitic changes, and that the supervention of rachitic bony deformity after a prolonged period of normal growth must be a great rarity if it occurs at all.

Scurvy in Nurslings in Berlin.—H. Neumann (*Berliner Klin.*

Woch., Jan. 2, 1905) discusses the prevalence of scurvy in artificially fed children. He tell us that the disposition to scurvy in infants is very great, and is increased by digestive troubles. The length of the bad nutrition bears no relation to the severity of the scurvy. It has resulted from the use of artificially prepared milk, either sterilized too long or chemically altered. Recently sterilizing has been done with a shorter period of heating, but this has not lessened the scurvy. It may arise from milk that has been heated only to a moderate temperature, or to a high temperature for a very short time. It occurs especially in weakly children. When pasteurized milk is used that is purchased loose in the street, it must be again heated before use, hence the pasteurization should always be done at home in closed bottles, and for a short time only. If used from the public supply the consumer has no knowledge of how long it has been heated, and hence cannot know whether it has been so changed as to be unfit for food.

Heredity and Early Environment in Relation to Disease and Defects of Children.—R. Clement Lucas (*Brit. Jour. of Children's Diseases*, Aug., 1904) says that an excess of girls among the offspring of a family leads to its extinction, and this condition often results from the marriage of English peers with American heiresses. In this way the custom of going to the United States for healthy wives to revive an effete aristocracy only tends to wipe out the latter. Short-lived families tend to rapid extinction. The writer refers to a number of diseases formerly believed to be hereditary, but recently proved to be infectious, such as tuberculosis, chromophytosis, malaria, rheumatism, and leprosy. He considers it doubtful whether syphilis can be transmitted beyond the first generation, and thinks transmitted syphilis a better term than hereditary syphilis. The disease is doubly disastrous when inherited from both parents, but in some instances the children of such parents are free of taint. The later children of syphilitic parents are more robust than the earlier. It seems as if a new type of the disease was produced by intermarriage and that leads to physical deterioration. It may be that rickets will be shown to be of microbe origin, not hereditary. The author considers rickets and syphilis the two great causes of deterioration in London. Gout, with which three-fourths of the families of the leisured classes of England are affected, is the sole surviving example of the clinical theory of joint diseases and it is possible that time will show this to be infectious, not hereditary. There are distinct grounds for doubting the hereditary transmission of cancer. The nervous system furnishes the clearest evidence of heredity in disease. Among idiots, it is said, 51 per cent. have a family history of mental defects, 20 per cent. of epilepsy, 16 per cent. of alcoholism. It is asserted that 3 per cent. of lawyers' children are mentally defective, 4 per cent. of doctors', and 18 per cent. of clergymen's; also, that of the members of all the learned societies of London, 11 per cent. are the children of lawyers, 9 per cent. of medical men, and 6 per cent. of clergymen. Intelligence is shown

to be bred, not created by education: so mental characteristics as well as physical are hereditary. Deaf mutism is probably hereditary. In some parts of Switzerland this occurs in 1 in 206 of the population. Color-blindness and polydipsia obey the same law of transmission as hemophilia: they are strictly limited to the males though transmitted only through the females. Ichthyosis and psoriasis are transmissible and the latter may be converted into the former in the next generation. Supernumerary toes, webbed fingers, absence of the patella or of the lateral incisor tooth may be hereditary. Intrauterine amputations are usually ascribed to pressure by the umbilical cord, but it is questionable whether strain sufficient to amputate a limb would not also so impede the circulation as to cause death, and strange that the amputation is of limbs and never of the head, though the cord is so often found around the neck at birth. It is also difficult to understand why these deformities are usually multiple, as the cord would be relaxed once a limb had been amputated. It is also strange that the three central fingers alone are sometimes absent. The writer thinks these phenomena are a manifestation of errors of development, a defect far back in the growth of the child. Perhaps defective food may act as a factor, as Shetland ponies have been produced through generations of bad feeding.

Influence of Heredity in Renal Pathology.—Castaigne and Rathery (*La Semaine Méd.*, November 9, 1904) denominated as renal debility that state in which a slight cause induces renal disease. They believe that heredity has a marked influence in producing this condition. They cite as examples the children who die from nephritis when the mother is affected before their birth with nephritis of pregnancy, as well as numerous families that have been observed in which several members of one generation have been affected with nephritis. The authors have sought to demonstrate that such cases of albuminuria are hereditary, and that physiological, cyclical, digestive, and orthostatic albuminuria are due to inherited tendency. They have examined the kidneys of four babies who died soon after birth, from nephritic mothers, and have recognized in the kidneys the changes of interstitial and epithelial nephritis. These cases represent the extremes of this condition, but many more slighter cases live and grow up. In babies from nonalbuminuric mothers they have frequently found renal lesions. They injected nephritic serum into female animals, and when these conceived, examined the products of conception, and found characteristic lesions of interstitial nephritis, which they attributed to the passage of the nephrotoxin from mother to fetus. In grave cases, in the mothers, they found conditions of the kidneys in the offspring which were incompatible with life. In chronic cases the lesions in the offspring were slighter, but such as would produce albuminuria. The amniotic fluid of the animals experimented upon was endowed with nephrotoxic qualities.

Abuse of Chloride of Sodium as a Cause of Nephritis.—M. C. Silvestri (*La Semaine Méd.*, January 4) believes that the abuse of chloride of sodium alone may produce nephritis in healthy individuals. This opinion is sustained by ten cases observed by the author. One was a case of a girl of 7 years, who had always evinced an extraordinary avidity for chloride of sodium. She had nephritis when observed, with grave edema. 9 per cent. of albumin in the urine, and hyaline casts. Cured by appropriate treatment, combined with abstinence from salt. She had a fresh attack a year later, from which she died. Another child of 4 years had also a severe attack of nephritis with hydrothorax, and 1.11 per cent. of albumin present, consequent on the abuse of salt. The author attributes these attacks of nephritis to the overuse of salt, producing renal irritation by its elimination in large quantities. There was produced glomerular nephritis, revealed by albuminuria. Gastrointestinal lesions and alterations of metabolism from abuse of salt would aggravate the renal condition.

OBSTETRICS.

Hepatic Insufficiency in Obstetric Practice.—J. Clifton Edgar (*Jour. Amer. Med. Assn.*, April 8) believes that the preventive treatment of much of the morbidity and mortality of pregnancy and of the puerperium depends upon the early recognition of the autotoxemia of pregnancy as manifested in the clinical picture of hepatic insufficiency. He believes it will soon be admitted that a specific toxemia of pregnancy exists. In any case, however, the presence of hepatic toxemia must be borne in mind, whether it be the principal state or accessory to other facts. A pregnant woman should be seen frequently by her physician and watched for general symptoms of overcharging of the blood with toxic material, such as nausea and vomiting, headache, physical and mental lassitude, high arterial tension, and alterations in character and disposition.

Blood in the Puerperium.—W. D'Este Emery (*Pract.*, March) finds that at term a patient may or may not be slightly anemic. If so, the hemoglobin is affected rather more than the red corpuscles, leading to a slight reduction of the color index. The leucocytes are increased in number, especially in first pregnancies, and the increase mainly affects the polynuclears. During a normal puerperium the number of the leucocytes commences to fall soon after delivery and continues to do so for about a fortnight, whereas the red corpuscles and hemoglobin fall slightly for a day or so and are then gradually regenerated. When the process is arrested by a general septic infection the fall in the leucocytes ceases, and is replaced by a gradual rise, the increase being due mainly to an increased number of polynuclears. At the same time, the regeneration of the reds ceases, and is replaced by a fall in the hemoglobin, and a smaller fall in the red corpuscles. The iodine reaction is well marked. When abscess formation occurs apart from a general septicemia, the rise in the leucocytes (due in this case also to

polynuclears) is more sudden, and a higher level is reached. The hemoglobin and reds are affected slightly, if at all; and the leucocytes give the iodine reaction.

Placental Alterations in Puerperal Eclampsia.—Carlo Colorni (*Annali di Ostet. e Gin.*, April) expresses the following conclusions as to the alterations of the placenta in cases of puerperal eclampsia. The morbid phenomena of pregnancy and puerperal eclampsia are the expression of a toxemia from the slow or rapid accumulation of poisons not sufficiently neutralized or eliminated as they are formed. We should distinguish between toxins produced by the placenta and accessory and secondary poisons of hepato-renal origin; eclampsia may be produced without the action of the last class. The lesions of the placenta and of the various organs are due to the poisons of the placenta itself, or the progressive and latent morbid state due to them, and to the occurrence of convulsions. These poisons come from the internal secretions or the altered metabolism of the placenta. There is no truly characteristic placenta of eclampsia, for the changes found in all of them may be seen in a less degree in the placentæ of normal women. There are secreting buds, so-called, which act as benign neoplasms, under certain conditions giving place to the formation of vesicular mole and malignant chorio-epithelioma. Their secretive function is inherent and specific to such neoplastic formations.

Cytology of Liquor Amnii.—The studies of Constantin Daniel (*Ann. de Gyn. et d'Obst.*, Aug., 1904), show that liquor amnii in normal pregnancy contains almost exclusively epidermal cells, often with a few amniotic cells. During labor there are, in about half the cases, a few leucocytes, usually polynuclear. In pathological pregnancies, especially with hydramnios, syphilis, and albuminuria, there are present more or less altered leucocytes and red blood cells.

Cysts of the Placenta.—Eduardo Festa (*Annali di Ost. e Gin.*, October, 1904) gives the results of his study of five cases of cyst of the placenta, four of them sub-choral, and one infra-choral, an exceedingly rare form. Cysts of the placenta are usually oval, springing from the fetal surface of the placenta. They are flattened and extend into the substance of the organ. The amnion covering them is easily detached, while the chorion forms an integral part of the cyst. They contain a muco-serous substance enclosed in a cavity surrounded by spongy tissue, adherent to the chorion, which constitutes the outer wall. They are from ½ to 2 centimeters in diameter, often very small. Out of 300 pregnancies seen at the Maternity at Florence only one large one was found. They may occur at any location on the placenta, the small ones being frequent on the edges. As to their origin, the most plausible theories are that they are hematic, or that they are from cellular secretion. The author formulates these conclusions: Cysts of the placenta are topographically sub-choral; rarely they are infra-choral, containing only epithelial elements of the chorion; the contents divide them into serous and hematic, the second form being

rare; they occur in about 18 per cent. of pregnancies; they have no connection with other maternal diseases.

Comparative Study of White and Negro Pelves.—Theodore F. Riggs (*Johns Hopk. Hosp. Rep.*, Vol. XII) finds that the pelves of white women are low and broad as compared with the more narrow and relatively deeper pelves of negresses; that contracted pelves are 3.74 times more frequent in negresses; that the children of mutiparæ are larger than those of principaræ in both races; that children born to women having normal pelves are larger than when the maternal pelves are contracted. The white child is larger than the negro by 1.5 cm. in length, 200 gms. in weight, and a few millimeters in the various cephalic measurements. The size of the child is greatly influenced by the occupation and surroundings of the mother previous to labor. There is no law governing the relation of the size of the child at term to the size of the mother's pelvis. The higher the grade of the race, the greater is the proportion of males to female children. There is a higher percentage of vertex presentations among negroes, and also a larger proportion of spontaneous labors. The writer believes that routine pelvimetry is an absolute necessity to scientific obstetrics.

Mechanism of Rotation in Labor.—H. Ostermann (*Zent. für Gyn.*, April) discusses the mechanism which causes rotation of the fetus during labor. He believes that the important factor which influences pressure of the uterus, in all positions, is the flexibility of the spinal vertebra of the fetus, when a portion of the body enters the birth canal; flexion varies in different parts of the spinal column, the portion least flexible is influenced by the portion of the canal that gives the least resistance to the pressure, up to the point when the movement is stopped by the soft parts, when the portion that most easily flexes is rotated into the plane of the canal. Hence, in all cases, the movements of the fetal body have a common cause. The forces that influence rotation are the uterine contraction, the form of the birth canal, the form of the fetus. The first factor is constant, varying in time and force only. Flexion of the fetal spine is most important, and follows certain laws. The birth canal is a section of a cylinder, with a conical passage below, opening forward, and the entire canal is curved forward. The uterine contraction pushes the fetus downward as far as it can, when the lower pole of the fetus curves forward. At first the fetus has its greatest curvature forward and sidewise. Were the spinal vertebræ inflexible, rotation of the fetus could not occur. The greatest curve of the fetus, the dorsal curvature, coincides with the curvature of the canal. When the back of the head and the back are placed somewhat sidewise, the rotation movement takes place toward the curvature of the birth canal, which it can most easily enter, until the posterior fontanelle moves backward or forward, according as the posterior fontanelle is lowest. If this sidewise bending is not present, the head may rotate forward. Progressive rotation, following flexion, is the most important movement in the mechanism of labor. Rotation is influenced by

the facility of flexion of the cervical vertebræ. It acts as in the mechanical play of a flexible cylinder, which possesses a double motion. The fetus turns slowly in its long axis, the force driving it acting through the flexion of the fetus, adapting it to the planes of the canal. Before rupture of the membranes, and during the descent, the fetus is in a bent position. The skull may be deflected according as the spine bends more or less in one or the other direction. This flexion acts conjointly with the bending of the lower pole of the body outward. The thoracic vertebræ are less flexible, and naturally the lower segment of the body is not so much affected by flexion as the upper. The changes of direction depend on the position of the fetus with reference to the mother's soft parts. In face presentation, the fetus bears different relations to the pelvis, and there is a tendency for the cervical vertebræ to bend backward. The coccyx fixes and limits the rotation, deflecting the head.

Labor in a Uterus Duplex with Vagina Septa.—Emil Pollack (*Archiv für Gyn.*, Bd. 75) relates the history of a case delivered by him at term, in which there proved to be a duplex uterus, with a completely separate vagina for each corpus uteri, which was not suspected until the coming on of labor. The right uterus was empty, and there seemed to be little contraction in it during the expulsion of the fetus from the contracting left half. The cervix of the left half dilated, and the fetus presented by the foot. Delivery was in every way normal, as well as the expulsion of the placenta from the right side of the uterus. Three days later occurred the expulsion of a decidua from the left uterus, or unimpregnated side, in the form of a complete sac. By observation of the patient later, it was found that the two uteri menstruated on the same day. The vaginal septum was thick, and the two orifices were separated from one another by a considerable distance. This septum resulted from a cementing of the anterior and posterior walls of the two vagina.

Histology of the Vesicular Mole.—Luigi Frassi (*Annali di Ost. e Gin.*, January, 1905) has made a study of the histological characters of the vesicular mole in nine cases, which presented themselves at the obstetrico-gynecological clinic of the University of Pavia. He gives the conclusions at which he has arrived as follows: (1) The vesicular mole is composed of a stroma similar to normal connective tissue and an epithelial covering; *i. e.* the elements of a villus. (2) The stroma undergoes regressive changes, while the epithelial tissue proliferates and undergoes regression. (3) Anatomically and clinically the changes in the mole begin in the epithelial covering, and these initiate similar changes in the stroma. (4) Unknown causes bring about the changes, beginning at the periphery of the villus. The destruction of the central parts of the villus and of the newly formed tissues arises from chemico-mechanical processes, either developmental or resulting from impaired nutrition. (5) Proliferation results in the formation of small excrescences on the villus. (6) The cellules of Langerhans also proliferate. The masses thus formed degenerate at the center.

forming many vacuolar spaces, which unite to form cysts divided by trabeculæ of connective tissue. These are larger than the vesicles of the villi, irregular in form and the connective tissue is scanty. (7) Proliferation is limited by some unknown cause. (8) Chorioepithelioma and vesicular mole are similar in structural elements and in their action toward the tissues, but the clinical results are different, and chorioepithelioma is comparatively rare after molar pregnancies.

Cesarean Section Following Ventral Fixation.—Alfred Hull Clark and Robert Lee Bowley (*Johns Hopk. Hosp. Bull.,* March) report a case of Cesarean section three years after a ventral fixation. External version was tried two days prior to operation. From then until the time of operation there was slight bleeding from the vagina. On the second day, while introducing the hand to do an internal version, it was found that the uterus was ruptured and Cesarean section was performed. The fundus of the uterus was found firmly fastened to the anterior abdominal wall by a broad area of adhesions which allowed no motion whatever. The anterior wall and fundus of the uterus were very much thickened and the anterior wall so sharply bent upon itself that its upper segment formed with its lower an acute angle which made a shelf of tissue. The posterior wall was very much stretched and thinned, and was ruptured enough to allow part of the fetus to prolapse into the abdominal cavity and bowels into the uterus. The rupture probably occurred at the time of the attempted external version.

Rupture of the Uterus During Labor.—N. Ivanoff (*Anne. de Gyn. et d'Obst.,* Aug., Sept., Oct., 1904) presents a study of rupture of the uterus during labor, based upon 124 cases contained in the records of the Moscow Maternity, from 1877 to 1903. From this he concludes that the majority of such ruptures in cases of placenta previa and of transverse presentation, are produced by acts of violence. Braun's decapitating book may become a cause of rupture. In the greater number of cases of rupture due to violence the tear occurs at one side of the cervix and tends to extend longitudinally or into the broad ligaments. Rupture in cases of hydrocephalus occurs often, in addition to thinning and distention of the uterine wall, because the condition is not recognized early. In contracted pelvis rupture may result from distention of the lower uterine segment and rubbing against the pelvic wall, and such a pelvis predisposes to rupture in labor through the formation of cicatricial tissue, where such friction has taken place in previous pregnancies. Spontaneous rupture, in flat-pelvis, are almost always transverse, in the supravaginal portion of the cervix, and rupture occurs soon after the beginning of labor. The cases called colpoporrhexis, are usually only ruptures of this character. In the case of contracted pelvis, if there have been several laborious deliveries and difficult operations, conservative treatment is attended by danger, especially if cicatrices can be palpated in the supravaginal part of the cervix. One of the factors predisposing

to rupture, besides cicatrices, malignant growths, imperfect development, etc., is inflammatory cellular infiltration. All so-called pathological modifications of the elastic tissue of the uterus are really only the physiological changes of pregnancy. Conservative treatment of rupture of the uterus during labor, gives results twice less favorable than surgical intervention. The latter permits definite hemostasis and cleansing of the wound.

Prophylaxis and Treatment of Ophthalmia Neonatorum.—A. Davier (*Bull. de la Soc. d'Obst. de Paris, No.* 4, 1904), strongly favors the use of argyrol, which contains 30 per cent. of silver as compared with protargol's 8 per cent. For slight catarrhal conjunctivitis instillations four or five times a day of a 5 per cent. solution are employed; for purulent ophthalmia, 20 per cent. solution is instilled every hour or half hour; as a prophylactic, a few drops of the latter solution immediately after birth. This strength is efficacious, painless, and causes no conjunctival irritation or secretion. If a secretion is present on the second day after birth, it is, therefore, evident that infection has occurred; whereas, with silver nitrate, such a reaction is very common.

GYNECOLOGY.

Action of the Röntgen Rays Upon the Ovaries.—L. Halberstaedter (*Berl. Klin. Woch.,* Jan. 16, 1905) chose rabbits for the experiments. The animal was stretched upon her back and one-half of the abdomen was exposed, while the other was protected by sheets of lead extending to the median line. The seance lasted half an hour, and was repeated once after several days. The distance between apparatus and abdominal wall was 12 cm. The animals were then killed at various intervals. Both the micro and macroscopic examination showed a difference between the ovaries. Those which had been protected from the rays were in every case larger and contained more Graafian follicles. These positive results led to a new series of experiments. In an animal which was exposed for four consecutive days under the above conditions, excepting the distance which was increased to 15 cm., the autopsy showed that the exposed ovary had shrunken to half the size of the other and that it contained not one Graafian follicle. Several other experiments gave similar results. A third series of animals was treated in the following way. An exploratory laparotomy was performed before the treatment and after the first exposure to the *x*-rays. In this way the course of the reaction to the rays could be studied and also differences pre-existing in the ovaries noted. This was done under morphine-chloralhydrate narcosis. The ovaries were exposed by a median incision and examined with care as to differences in size and number of Graafian follicles. The abdomen was closed after the inspection, which all of the animals survived, and they were then subjected to the *x*-rays. The deduction from this series was that the ovaries which had been exposed and found equal in all respects showed after the treatment marked differences in size and in the number of follicles. The latter were found to have diminished 10 days after treatment and after 15 days

they have completely disappeared. In those animals of the first series which were subjected to a milder treatment the Graafian follicles had entirely disappeared, but it is not impossible that new ones could have been formed from the primordial follicles and ova which were still extant. In those animals which were subjected to a more severe treatment these structures were also found to have disappeared or to be undergoing degeneration. Future experiment will show whether their ovaries have permanently lost their functional power. The histological examination showed the presence of a large number of round, sharply defined cavities in the center of which was a homogeneous mass staining diffusely with eosin, and in which the remains of nuclei could be recognized. That the ovaries are especially susceptible to the rays is shown by the marked reaction occurring in them, although they were 4 cm. more distant than the skin, upon which no effects were noted, in some cases in which marked changes took place in the ovaries. Atrophic changes occurred in the testicles of rabbits which were similarly treated. The writer calls the attention of those occupied in *x*-ray laboratories to the danger of exposure and to the necessity of suitable protection.

Lumbar Anesthesia in Obstetrics and Gynecology.—J. Müller (*Monats. für Get. u. Gyn.*, February, 1905) describes the technique. The patient is placed upon her side with chin and knees as closely approximated as possible. The space between the fourth and fifth lumbar vertebræ is chosen. Adrenalin is used to neutralize the poisonous effects of the cocaine. One cubic centimeter of a ½ per cent. solution of adrenalin is injected and the needle allowed to remain in place for five minutes. At the end of that period a second injection is made, using a 1 per cent. solution of cocaine. A material of 32 cases was tested. The cutaneous anesthesia produced varied within wide limits. In 5 cases it reached only to the inguinal region, once to just above the symphysis, 4 times to the region of the unbilicus, 12 times to the cestal arch, 4 times to the clavicles, 5 times over the entire thorax. In one case the anesthesia was complete only at the vulva and vagina. The effect in lessening the pain of the uterine contractions was noticed in about 8 minutes after injection. The anesthesia lasted on an average of an hour to an hour and a half. About 10 minutes after injection of the cocaine there were nausea and violent vomiting in some cases. Caffeine was used subcutaneously, but without satisfactory results. As the anesthesia lasts but 90 minutes at most, it is of importance to select the right time for the injection. When this has been fortunately accomplished the results are most gratifying, as the child birth is without pain. Indications are severe labor pains and all operations. The method was not tried on eclamptic patients, as none were available. In case of gynecological operations the results were very satisfactory. The operation should not last longer than an hour. The results are questionable in laparatomies. Chloroform may be used to continue the narcosis, and but small quantities will be required.

Physiological and Therapeutic Action of Aspirin, Especially on the Uterus.—Francesco Chidichimo (*Annali di Ostet. e Gin.*, April) has studied the physiological and therapeutic action of aspirin, experimenting on dogs and rabbits. Dogs can take as much as 20 centigrams for each kilogram of weight without any worse effects than vomiting and diarrhea. The lethal dose is 50 centigrams per kilogram of weight. It diminishes arterial pressure for from two to four hours. The heart sounds remain regular and rhythmical under therapeutic doses. The respiratory movements are not modified, except by large doses, when they become slow. Temperature is not changed. Pressure in kidneys, liver, and spleen is increased. On unstriped muscle, aspirin has a characteristic action, slowing its contractions, while they are still rhythmical and regular. The action on the uterus, producing slowed contractions, is the same in the puerperal and unimpregnated states. Tetanus of the uterus is never produced. Aspirin is absorbed by stomach in from fifteen to thirty minutes, and its action lasts for several hours. Injected subcutaneously, it is rapidly absorbed. Aspirin is of great use in ovarian dysmenorrhea, calming the nerves and lessening ovarian hyperesthesia. It is also of value in functional uterine pain. In grave disease of the adnexa and in chronic metritis the pain is lessened. Given before menstruation, it prevents dysmenorrhea. It acts well in amenorrhea and menorrhagia. It is especially useful in young girls.

Pseudohermaphroditism.—Ernst Unger (*Berl. Klin. Woch.*, April 24) gives the history and the autopsy and histological reports of a case of pseudohermaphroditism. The patient, apparently a woman, had never menstruated. She had epilepsy from the fourteenth to the seventeenth year. She died a few days after removal of the Gasserian ganglion for facial neuralgia. Her figure was of the female type. There were a few hairs on the chin. The skeleton was small. The mammæ were fairly developed, with small nipples, the left breast smaller than the right, which contained considerable gland tissue. The areolæ and tubercles of Montgomery were undeveloped. The mons veneris and labia majora were present, but no labia minora. The clitoris was the size of a hazel nut, and of the male type. There was a rudimentary vagina, with an opening the size of a walnut, an annular hymen, and a urethra which extended inward 2½ centimeters. On each side of the hymen were two blind passages, but no gland structure. The opening in the hymen was the size of a linseed. The vagina was a blind sac, at the bottom of which was an opening the size of a pin, which could be followed a few millimeters only. On opening the abdomen no uterus was to be seen, no ovaries, or tubes. The bladder occupied the center, held by a broad band on each side In this band, on each side, were a rudimentary epididymis, a small testicle, then a body shaped like the fundus uteri, prolonged down toward the base of the bladder by two Wolffian ducts, which united at their distal extremities. Beyond the uterus didelphys, on

each side, was a remnant of the inguinal ring. At either side was a remnant of the duct of Gärtner, terminating, in the labium mojus, in a blind end. This is a structure not present in the female type. The case is thus one of pseudo hermaphroditismus masculinus internus et externus completus. Both testicles were contained in the abdomen, near the abdominal ring, and were atrophied. The epididymis was of the puerile type, and there were no spermatocysts. A tubular adenoma arose from the spermatic canal, an occurrence which the author finds to be unique. He calls it an adenoma tubularis testiculi ovotestis.

Generalization by the Lymphatic Route of Cancer of the Uterus.—Mme. Oltramare (*Ann. de Gyn. et d'Obst.,* May, June, 1904), first considers the modes of extension of various forms of uterine cancer. She states that the best results in operating for malignant growths, are secured by removing not only the affected organ, but the regional lymph nodes and their afferent vessels. Applying this rule to the uterus it would appear to be necessary to remove en masse the uterus, vagina, broad ligaments, ureters, and lymphatics to the iliopelvic lymph nodes. She then calls attention to the fact that involvement of the lymph nodes occurs in only about twenty per cent. of the cases. The writer holds that extensive extirpation of lymph nodes in cancer of the uterus is useless, dangerous, and gives greater chance of cancerous inoculation, than vaginal hysterectomy. She believes that extirpation of the regional lymph nodes influences the prognosis unfavorably, because recurrence may still take place in the broad ligaments.

Abdominal and Vaginal Hysteropexies.—C. Jacobs (*Bull. de la Soc. Belge de Gyn. et d'Obst.,* T. XV., No. 2) presents the following statistics of his operations and their results. From 1890 to 1897, 70 abdominal hysteropexies, 29 subsequent pregnancies, 26 of these in women who had previously borne children. Of the 29 subsequent labors, 17 normal, 1 face presentation and forceps delivery, 1 breech terminated by version, 7 miscarriages of which 1 was accidental and 1 dûe to placenta previa. Vagino-fixation, 21 cases followed by 8 pregnancies, 3 of which ended in abortion. Vaginal hysteropexy, 69 cases, 21 subsequent pregnancies all at term; 3 of these terminated by forceps on account of slow labor; no dystocia. The writer emphasizes the favorable results of the last operation, which, in the hands of Dührssen has given but 2 instances of dystocia and 5 of slow labor in 72 cases. The two other procedures he would proscribe completely in women capable of child-bearing.

ITEM.

Dr. John F. Winn has been appointed professor of obstetrics at the University College of Medicine at Richmond, Va.

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ORIGINAL COMMUNICATIONS.

TOXEMIA OF PREGNANCY WITH VOMITING.

ITS TOXIC MANIFESTATIONS, ITS RELATION TO ECLAMPTIC TOXEMIA, ACUTE YELLOW ATROPHY AND EXPERIMENTAL NECROSIS OF THE LIVER.

BY

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WITH the introduction of the principles of asepsis into obstetrics and the consequent lowering of the death rate from puerperal infection, the attention of the physician has been directed to the study and relief of those morbid manifestations, accompanying pregnancy and the puerperium, which cannot be shown to be due to a direct bacterial infection.

This has led to an increased knowledge of such diseases as eclampsia and hyperemesis gravidarum, mainly through clinical and post-mortem studies. A closer investigation of the symptoms and course of the disease and of the pathological lesions has shown that they have a common origin in a state of intoxication, always accompanied by functional incapacity of the liver. This is shown during life by the well-known manifestations of the autointoxi-

cation and by the excretion of products of faulty metabolism, such as leucin and tyrosin, known to be associated with liver insufficiency. Pathological studies have shown that the liver is itself the seat of grave changes which seriously interfere with the proper functional activity of the organ. These facts suggest the theory of an autointoxication due to hepatic insufficiency as the underlying factor in the causation of these morbid manifestations.

To this autointoxication or hepatotoxemia is given the name toxemia of pregnancy, and it is regarded by some obstetricians as the cause of many of the troubles of gestation. Thus, to this origin, is ascribed grave vomiting of pregnancy (hyperemesis gravidarum), puerperal neuritis, eclamptic toxemia and perhaps gestatory psychoses. In addition it is believed that many of the minor disturbances of pregnancy, as gastric disorders, headache and certain skin lesions, may be referred to a similar source.

The following review of the literature on this subject may seem to be somewhat extensive, but is thought to be necessary. It is reviewed for the purpose of showing (1) the identity of the liver lesions of toxemia of pregnancy with vomiting and eclamptic toxemia.* and for the comparison of these lesions with those of experimental liver necrosis; (2) the frequency with which acute yellow atrophy occurs and (3) the presence of more marked toxic symptoms.

The similarity between the liver lesions of toxemia with vomiting and of eclamptic toxemia is suggestive. Stone, in a comprehensive and searching review, draws attention to this resemblance. He reports three cases of toxemia with vomiting with one death. Postmortem examination showed acute yellow atrophy. His conclusions are as follows:

"Eclampsia is now generally recognized as a toxemia whose chief lesion is a degeneration and necrosis with multiple hemorrhages of the liver. The kidney changes, although forming an important part of its terminal features, are essentially secondary. All the older theories of eclampsia have been successfully applied

* At present, there is tendency amongst some obstetricians to refer to all of the manifestations of toxemia of pregnancy as eclampsia. This I would deprecate. The term, eclampsia, as usually understood and generally used, refers to convulsions, either gestatory, intraspartam or puerperal. It would therefore seem preferable that the autotoxic state be designated according to the more prominent symptom, as (a) toxemia of pregnancy with vomiting, and (b) eclamptic toxemia (toxemia with convulsions. This division will be followed in this paper.

For further study of the identity of these conditions, I would refer the reader to Stone's article in American Gynecology, 1903, and Edgar's Theory and Practice of Obstetrics, 2d edition, New York, 1904.

to the condition which is described as hyperemesis gravidarum. We have also found under this latter clinical picture lesions which are identical with those occurring in acute yellow atrophy of the liver. At the same time we know but little in regard to the pathogenesis of this latter disease, except that in one-quarter of its cases it is associated with pregnancy, thus indicating that it is probably due to a toxemia. An analysis of its symptoms also shows it presents essentially the same clinical picture as eclampsia. In other words, under the clinical titles of hyperemesis gravidarum, eclampsia and acute yellow atrophy of the liver, we have found enough to warrant a definite statement that they are one and the same disease."

In Stone's cases the vomiting began early in pregnancy, in two it is described as "coffee ground vomiting." The latter was marked in the patient who died. Jaundice was not observed. One patient suffered from epigastric pain. The postmortem examination showed acute yellow atrophy of the liver. The description of the liver follows:

"Color—Light yellow consistency, easily pitted under finger pressure; cut surface smooth and of fatty appearance; lobules distinguishable; no congestion; vessels empty; both lobes showed uniform character; weight 36 ounces; gall-bladder contained bile; ducts pervious.

"Microscopic.—The cells of the greater part of each lobule have undergone fatty degeneration. Around the periphery of the lobule is a fringe of cells which are in a state of coagulation necrosis. The periphery of the lobules is further characterized by marked congestion of the capillaries issuing from the portal (interlobular) veins. This injection can be seen in the stained specimen with the naked eye. In the interlobular tissues there are blood vessels into which has occurred an immigration of leucocytes. The sublobular veins are empty." Thus he finds under the clinical picture of hyperemesis a lesion corresponding to acute yellow atrophy of the liver.

But this is not a new theory. Roughton, in 1885, suggested the probability of a common cause of persistent vomiting and eclamptic toxemia. He reports a case of a primipara, aged 20, who began to vomit in the sixth week of pregnancy. This continued with increasing severity until four and one-half months, when it became continuous. Emaciation ensued and the eyes were sunken and surrounded by black halos. Jaundice was present and the urine contained albumen and casts. With the onset of delirium

labor was induced. Bile stained liquor amnii was found. The patient had post-partum hemorrhage, but recovered after a slow convalescence. In this case there was, I think, sufficient clinical data to make a diagnosis of acute yellow atrophy.

Gueniot from a study of collected cases divides vomiting of pregnancy into simple and grave, or irrepressible. He reports 118 cases with 46 (38.9 per cent.) deaths as follows:

RECOVERIES—SEVERE CASES.

Without abortion	31
With spontaneous abortion	20
With induced abortion	21

DEATHS.

With abortion	28
After spontaneous abortion	7
After induced abortion	11

These results occurred under all forms of treatment from copious draughts of wine to the application of leeches to the cervix.

Graefe ascribes the irrepressible vomiting of pregnancy to hysteria in many cases and thinks that suggestion and isolation of the patient are important in treatment. He reports one case cured by reposition of the uterus and the administration of purgatives and tonics.

Zabonisky's experience has led him to believe that the vomiting in many cases is due to a reflex neurosis and that the interruption of pregnancy is not always curative. He reports three cases, two primiparæ and a multipara, all of which terminated fatally. The postmortem examination disclosed a cancer of the stomach in one, pulmonary tuberculosis with fatty degeneration of the liver and kidney in the second, and in the third acute yellow atrophy. In the first, vomiting began at the eighth month; in the second, about the first month and ceased by the fifth; in the third, jaundice was present and albumen appeared in the urine.

Baisch does not accept unreservedly either of these theories. He regards hyperemesis as a reflex phenomenon, affecting either the motor or secretory function of the stomach, due to an irritation preceding from the periphery and transmitted to the vomiting center. The uterus, the nerve centers in the medulla or the stomach itself may be points where the exaggeration of the reflex occurs and, consequently, treatment should be directed to meet each individual case. In his experience the cases of the gravest prognosis were accompanied by abnormal saliva-

tion. The relation between the villi and the uterine wall is said to be the probable primal cause of the disturbance. He summarizes twenty-two theories in regard to causation, grouped under the four headings of (1) definite organic lesions, (2) autointoxications, (3) reflex neuroses and (4) bacterial infection. He reports two cases in which pregnancy was interrupted with a favorable outcome.

Beatty reports a case of vomiting at the second month, accompanied by jaundice and colorless feces. There was delirium before death and the autopsy showed acute yellow atrophy. He also collected fourteen cases of acute yellow atrophy from the American literature.

McPhedran and MacCallum report a case of grave vomiting, at four months of pregnancy, in a primipara, aged 24. The onset followed an attack of influenza from exposure. Epistaxis was noted, also jaundice and clay-colored stools. Hebetude persisted for five days, passing into coma with muttering. Vomitus was dark and grumous. Bile and leucin and tyrosin crystals were present in the urine, microscopically. Postmortem examination showed acute yellow atrophy of the liver, confirmed by histological examination. Liver was 25 ounces in weight, flaccid rather than friable, and red with yellow patches. The hepatic parenchyma was best preserved immediately beneath the capsule. The first change from the normal was manifested by coarse granulation or fatty vacuolation. The enlargement of the bile capillaries is another feature of the change. In cells which are coarsely granular but from which fat is absent, the membrane only of the nucleus may be detected, all else having vanished. In the enlarged cells, in which the fatty degeneration alone is prominent, the fat is collected in large droplets, separated from each other by protoplasmic septa in which the granules are collected. Examples of cell division are sufficiently abundant to warrant the conclusion that while there is atrophy in one part, there is regeneration in another. It might be thus possible to explain cases of recovery from acute yellow atrophy. They conclude that the destruction of the liver cells points to the presence of a poisonous element as the cause of the disease.

Another case which is reported by Snell with postmortem, is interesting from the similarity of clinical course to the one reported here and also from the histological description. Vomiting occurred in a primipara, aged 20, at three and one-half months of pregnancy; it continued with increasing severity until five months.

The vomitus was at first blood stained and later "coffee ground." Slight jaundice was present in the fifth month, and there was wandering delirium and much emaciation. Death occurred seven days after the jaundice first appeared. Necropsy examination showed a dark red liver mottled with yellow. Histologically, the different parts showed varying amounts of connective tissue. Where the change was most advanced, there were large tracts in which the liver substance was represented only by a few islands of hepatic tissue, many of which contain a few droplets of fat. Granular masses of pigment were also seen. Numerous branching ducts lined with cubical epithelium were present; where the process was most advanced, the liver lobules were large. The center of the lobule was occupied by a loose reticulum of connective tissue in which a few liver cells undergoing fatty degeneration were enclosed. The connective tissue everywhere took the form of a loose mesh work with oval or spindle-shaped nuclei. The degeneration of the liver cells was seen only where the connective tissue was formed. He concludes that the primary process was an acute formation of connective tissue, the destruction of the liver substance being secondary.

Rudisch and Strauss report two cases of acute yellow atrophy, one a primipara, aged 21, was four and one-half months pregnant. The history was of two weeks' headache, vomiting and epigastric pain. Epistaxis, jaundice and albuminuria were present with hyperesthesia and subconjunctival hemorrhages. Stupor, with increasing icterus, was followed by death. At necropsy the liver was found to be soft, fatty, with ochre-yellow areas surrounded by a red rim. Microscopically, there was granular degeneration and towards the center of the lobule the cells became more and more changed. There were a few leucocytes and no regeneration. They suggest coagulation necrosis rather than fatty degeneration.

Behm claims that the source of the poison is to be sought in the degeneration of the placental cells, and explains its frequency in the early months by the fact that at this time the active degenerative changes occur. He divided the cases as to etiology into five groups: (1) Diseases of organs; (2) reflexes from pelvis; (3) infections; (4) intestinal autointoxication; (5) retained placental tissue following abortion. He notes illustrative cases; in one the placenta was retained several days after abortion and vomiting persisted until its removal.

Charpentier de Ribes and Bouffe de St. Blaise report a case

of a primipara in the sixth month of pregnancy, who was taken with severe vomiting which became more or less persistent. In three weeks she was delivered spontaneously and vomiting stopped; but delirium grew worse, passing into convulsions, and death occurred seventeen days after labor. The urine contained a large quantity of albumen. Autopsy revealed hemorrhagic areas in liver, an old infarct and many subcapsular hemorrhages. The complete analogy between this lesion and that of eclampsia is noted and it is considered sufficient proof of the hepatic origin of the vomiting.

Bassoe and Wells report three cases of acute yellow atrophy of the liver, one, a primipara, aged 20, became sick in the sixth month of pregnancy with headache, slight jaundice; no mention is made of vomiting. A few days later she developed some fever and became comatose. Urine showed bile, leucin, tryosin, albumin and casts. Coma continued for eighteen hours without convulsions or delirium; terminating in death. At necropsy, the anatomic diagnosis was as follows: Puerperal state, general jaundice, acute yellow atrophy of the liver, multiple hemorrhagic extravasation (subpleural, subpericardial, periaortic, subcutaneous and pulmonary). Enlarged thyroid and hypophyses. Acute degeneration of kidneys, moderate right hydronephrosis.

The liver appeared much smaller than normal when *in situ*, weight was 1,020 grammes. Surface was smooth, presenting red and yellow areas. Cut surface was mottled, brownish red and yellow. Microscopically, in a section through an area more normal than the rest of the organ, there were areas of necrosis both central and peripheral which showed remains of destroyed liver cell nuclei lying in the original stroma which was unaffected. In a section through a yellow area, the lobules were indistinct and smaller, individual cells appearing as swollen yellow granular necrotic plaques with indistinct outlines, showing no nuclei. A section through the red area showed more marked changes with proliferating and new formed bile ducts. The kidney showed cloudy swelling. They draw attention to the theory of autolysis, first suggested by Flexner, and remark that the changes may be due to this. Correlating the processes of autolysis and acute yellow atrophy, they first sum up the usual changes, a marked necrosis of the liver, involving all the cells of the lobules in large areas, sparing other areas and also sparing the connective tissue of the lobules that are involved, the blood vessels and interlobular ducts. In many cases greater or less degrees of regeneration have been observed. This

is found to consist of a general proliferation of the surrounding cells, both of connective tissue and of bile-duct epithelium. The former multiplies and leads to a large excess of connective tissue, which would undoubtedly prevent the liver from ever becoming normal again. "It would seem, therefore, that we are dealing with an intoxication by a substance with a considerable degree of specificity for certain cells, those of the hepatic cords, which spares ever so closely related cells as those of the bilt ducts." They also refer to the lack of fat or of fatty degeneration as shown by osmic acid staining.

Opie, in a contribution to the pathology of necrosis of the liver, reports a case of a primipara, aged 28, in the second month of pregnancy, who complained of nausea and vomiting, which became so persistent that rectal feeding was necessary. Vomiting continued and became blood stained. The uterus was emptied after twenty-five days' treatment. Vomiting ceased but death occurred three days later, after torpor and coma. There was no jaundice. Necropsy examination showed the liver to be of small size, 1,000 grammes, soft and, on section, of a bright yellow color. Microscopic examination showed that the central part of each lobule had undergone necrosis, leaving intact a narrow peripheral zone. Immediately about the central vein of each lobule, nuclei of the endothelial cells and rarely nuclei of the hepatic cells were preserved, but elsewhere both had disappeared. In the peripheral part of the necrotic area occupying a zone in width about one-fifth of the radius of the lobule, parenchymatous cells were broken into particles and had lost their columnar arrangement. In the central part of the lobule, necrotic cells were vacuolated, as if the seat of fatty degeneration. In the peripheral zone, nucleated hepatic cells in contact with the necrotic tissue had undergone advanced fatty degeneration. Opie designates this condition midzonal necrosis and likens it to Stone's case. He considers the association of midzonal necrosis and advanced fatty degeneration to be due to the fact that the cells least injured undergo fatty degeneration. Of nine cases of midzonal necrosis, it occurred three times associated with pregnancy, and, of these, two had puerperal infection. Reference is also made to four cases of peripheral necrosis of the liver, all of which occurred in association with pregnancy. Three cases of eclamptic toxemia preserved characteristic lesions. The liver was studded with hemorrhagic foci, varying in size, in such areas, the liver cells had undergone necrosis and lost their nuclei. The body of the cell, losing its definite outline, was merged with

the dense network of fibrin, which made its appearance throughout the necrotic tissue; abundant hemorrhage had occurred in and about the necrotic tissue. The smallest necrotic areas were always in contact with the portal spaces. The fourth case, a Cesarean section with general peritonitis, showed similar lesions in a more marked degree. Opie states that midzonal necrosis or combined middle and central zonal necrosis is probably an early stage which has its termination in acute yellow atrophy, and that the liver is enlarged rather than atrophied.

There has been so far considered only the results of the toxic process in so far as it affects the liver. There is no doubt that grave changes do occur in the kidney and other organs, as evidenced by hemoglobinuria, albuminuria and casts; but they are of secondary importance. Stone in referring to the proof of the greater importance of liver lesions states that eclampsia without albuminuria occurs in one-tenth of all cases, and that albuminuria may be one of the last signs. I consider, however, that this is simply a question of the stage and grade of the disease; if cases are seen at the onset of toxic symptoms the albuminuria is often absent and, in fulminating cases, death occurs without marked kidney change. The frequency of albuminuria is to be considered; in pregnancy, it is the rule rather than the exception, as shown by Little's statistics. These statistics bear out a study of my own, made at the Lying-in Hospital, in which albumin was present in varying amounts in about 90 per cent. of all primiparæ at or about labor. Meyer-Wirz, in a clinical study of 117 cases of eclamptic toxemia, reports that in 38 who were under observation before the onset of the disease, eight showed complete absence of albuminuria before the first convulsion; also that in the 35 cases, which came to autopsy, eight were shown to be free from renal affections. No doubt as the disease progresses there cannot but be grave changes in the kidneys, *i.e.* fatty degeneration, cloudy swelling, acute nephritis, etc.

Bar, in analyses of the microscopic findings in twenty-four eclamptic subjects, does not remember a single instance in which gross pathologic lesions were not seen. In twenty-four cases, the kidneys were profoundly affected in four, the lesions were moderate in nine, and in eight they were of slight intensity. The liver was affected in most cases, but not proportionately to the intensity of the kidney lesions. Some of the mildest kidney lesions were accompanied by the severest liver lesions. He concludes that

the disease is due to the action of some powerful poison, which may affect the kidneys in some cases and the liver in others.

The symptoms of eclamptic toxemia, with the accessibility of the urine for examination, naturally led to the conclusion that the disease was due to an acute inflammation of the kidneys. However, areas of necrosis are found so constantly in the liver that they are a characteristic of the condition.

Neuritis is among other evidences of toxic disturbance in pregnancy. Of this interesting condition, Eulenberg reports four cases, complicating vomiting of pregnancy, with a collection of thirty-eight other cases of puerperal neuritis. He divides the affection into two groups, basing the distinction between them simply on the extent and severity of the lesions presented, and so divides them into (*a*) the less severe and localized forms and (b) severe diffuse forms which may simulate Landry's paralysis or involve the cerebral nerve areas. He concludes that they usually arise from autointoxication.

Nicholson divides the etiological classification as follows: (1) Those cases arising from a toxemia; (2) those cases arising from a septic process; (3) those cases resulting from some mechanical agent during labor or in the early puerperium. He reports two cases, in one of which there is a vague history of a mild toxemia in the early months; the other followed a difficult forceps labor with unrepaired complete laceration of the perineum seen two months after childbed. He states that the improvement in severe conditions is slow.

Landemann also reports a case of pregnancy with polyneuritis. Necropsy examination showed cloudy swelling and fatty degeneration of the liver without necrosis of cells. The spleen and kidney showed coagulation necrosis, which he considers to be an evidence of the toxic cause of the disease.

The writer would add the following case of toxemia of pregnancy with vomiting, jaundice and neuritis.

Primipara, aged 36; married.

Previous History.—Patient was never a strong child and had diseases of childhood. No history of acute rheumatism, but has had scarlet fever. Has had "heart disease" attributed to lifting a heavy weight.

History of Present Illness.—Patient had been married five months. Menstruation was present once after marriage. When two months pregnant vomiting began in the mornings, persisting with intervals of relief. At three months, vomiting was so per-

sistent as to confine the patient to bed. She, however, looked upon this as the usual course and refused to call a physician. At four months, vomiting was so severe and continuous that a physician was consulted. He treated the patient with rectal feeding, cocaine by the mouth, and after several days curetted her in bed, in the Sims position and without anesthesia. Eight days after this curettage the writer was called to take the case owing to the departure from town of the first physician, who assured me that the uterus had been thoroughly curetted. The vomiting, at that time, was persistent and continuous, and there had been no retention of food for three days. Vomitus was dark and blood-stained. Face was drawn, tense and anxious, with prominent eyes and photophobia; the patient was restless and querulous. The odor of acetone from the breath was distinctly evident on entering the room. There was slight jaundice. There was a marked limitation of field of vision. Patient complained of pain in the epigastrium and in the region of the lower part of the esophagus. Temperature was 99° and pulse 140, thready and of extremely high tension. Heart was slightly enlarged and showed a mitral stenosis; lungs were negative. Abdomen was flaccid and no pain nor tenderness was appreciable on palpation; no enlargement of the liver could be made out and no tenderness on pressure could be elicited.

Vaginal examination revealed a soft, congested vagina and soft cervix, which was firmly closed. Uterus was soft, about the size of a two-months pregnancy, markedly retroverted, but mobile and capable of replacement. Appendages were free and negative and no vaginal discharge was present.

Urine was scant, of high specific gravity and showed a large amount of albumin, one-fifth by bulk, with granular and hyaline casts in very large numbers. Leucin and tyrosin were also present microscopically.

The treatment begun at this time consisted of large rectal salines as often as they could be retained, predigested food by the bowel in the form of peptonized milk, predigested beef, etc. Chloretone, grs. v, was given every four hours to control irritability of the stomach and restlessness of the patient.

Patient improved slowly during the first week and, at the end of that time, vomiting was only occasional. Easily digested food, as light cereals, broth, etc., were well taken. Celestin Vichy was retained often to the amount of two liters daily. As the irritability of the stomach improved small doses of extract of ergot and

strychnia were given with the aim of aiding involution of the uterus. This involution, however, did not progress.

The urine increased in amount and albumen lessened, although granular casts were still present. The jaundice still persisted. There was no vaginal discharge; pain was less and still referred to the epigastrium. Temperature was 98°-99° and pulse was 108-120.

This condition continued until five weeks after the first curettage. Vomiting still continued in a mild form, although it was absent once for two days. Jaundice disappeared at the end of the third week. Nutrition improved. An annoying complication, an infection of the gums, caused an abscess to form at the roots of two teeth and necessitated extraction to favor drainage. An abscess also formed in the submaxillary space from breaking down of an infected gland. The temperature during this time varied from 98°-100°, and was thought to be accounted for by the suppurative condition of the jaw and a mild bronchitis which began during the fourth week after the first curettage. Pulse ran from 104-120 with good tension.

The medication at this time consisted of fluid extract of digitalis with chloretone and trional at intervals for sleeplessness and pain. Ergot was discontinued in the second week after first operation.

Daily examination of the urine showed an occasional trace of albumin and an occasional hyaline cast. Small saline enemata and copious draughts of vichy were given. The condition of the uterus remained unchanged, soft, about the size of a two-months pregnancy, with cervix tightly closed. No vaginal discharge was evident and a vaginal douche was given every other day to promote involution. The possibility of retention of products of impregnation was considered; but, in view of the absence of pelvic or uterine symptoms, the patient's precarious condition and the assertion of the operator in regard to completeness of the curettage, a secondary operation was not done. In the sixth week after the first curettage, pain appeared in the legs. This was referred to the extensor muscles of the thigh and later involved the flexors of both thighs and legs with considerable wasting and marked hyperesthesia. Flexion and extension of the toes was imperfect, and stimulation on the sole of the foot caused a movement of the leg, but none of the toes. Nerve points of leg were sensitive to pressure. From severity of the pain and loss of power, with the reaction of degeneration, a diagnosis of neuritis was made. During this time there were marked mental symptoms, *e.g.* wan-

dering, loss of memory, inability to recognize friends and hysterical manifestations. These were so marked that the possibility of Korsakoff's psychosis was considered.

At the end of the sixth week, while vomiting was still occasional, the temperature which had previously been 100° or lower, began daily to take on a progressive rise, arriving finally at 104°, pulse 120.

At this time there was a slight discharge, and vaginal examination found the cervix to admit one finger. The examining finger was able to feel placental masses. Curettage was done with temperature 104°, pulse 140, six and one-half weeks after the first curettage.

Ether was given, in spite of the bronchitis, as the heart condition was such as to make chloroform inadvisable. The cervix was found to admit one finger and was easily dilated instrumentally. At the fundus was found a placental mass intact, as large as an orange measuring 4 x 5 x 3 cm. This mass was firm and odorless. There was slight softening over an area as large as a quarter in one corner. The remnants of the membranes could be made out and the remains of the cord 3 cm. long. Uterus was gently scraped with a large curette and placental forceps, and packed with gauze which was removed on the following day. Hypodermoclysis was given under the breasts and repeated in 24 hours. The patient's condition was most precarious for the first three days, involuntary defecation being present. Pulse ran from 130-150, requiring constant stimulation with digitalis, strychnia, adrenalin and camphorated oil hypodermically.

Temperature was normal on the third day and convalescence was slow, interrupted by the sinus in the jaw requiring further drainage. The neuritis did not improve and the loss of power was marked. At the present time, twelve months after the curettage, the patient has not entirely recovered complete power in her legs. The pelvic examination, two weeks after operation, showed a well-involuted uterus with healthy appendages, but again retroverted. Careful inquiry laid bare the fact that the fetus had escaped, the day following the first curettage, while the patient was being given an enema.

Diagnosis.—Toxemia of pregnancy with vomiting. Acute yellow atrophy of the liver. Mitral stenosis. Mild bronchitis. Puerperal neuritis. Retained secundines.

This case is chiefly of interest from the fact of its similarity in clinical history to cases reviewed in this paper (vide supra)

in which the post-mortem reports showed acute yellow atrophy. There is throughout these reports a singular similarity in clinical reports in those cases which had been curetted or had labor induced. In cases without marked toxic symptoms, vomiting ceased as soon as the products of conception, including the placenta, had been removed; although death may have occurred later. Behm's case in which the placenta was retained, vomited until its removal. The case reported here, although the symptoms were alleviated by flushing the organs through the stomach and rectum, vomited more or less until removal of the placenta, six and one-half weeks after the escape of the fetus. In this connection Hitschmann reports a case in which eclampsia occurred in a four and one-half months' pregnancy as the result of a mole.

Gueniot's figures show conclusively that termination of pregnancy has a direct effect upon the mortality. In cases without abortion, the mortality was 90.2 per cent.; with spontaneous abortion, 35 per cent., and with induced abortion, 52.3 per cent. Hirst in 239 cases, gives a mortality of 30.7 per cent. in all. In cases treated by abortion the mortality was 25 per cent.; without abortion, 49.1 per cent. Thus, it will be seen that toxemia or pregnancy with vomiting is a disease which has a mortality even higher than that of eclamptic toxemia, of which we may take Meyer-Wirz' figures (27.3 per cent.) as a very fair estimate.

The question of anesthesia is an important one both in toxemia with vomiting and eclamptic toxemia, should it be necessary for operative interference or the control of convulsions, in view of the fact that Ballin has collected nine postoperative cases of acute yellow atrophy of the liver following chloroform narcosis. Vonderbrugge also reports a case of death in a child, 10 years old, with icterus and vomiting. Autopsy showed fatty degeneration of heart, liver and kidney. So, it would seem that in these conditions, it would be better to abstain from adding fuel to the fire and substitute ether for chloroform as much as possible.

In the review of these cases one is struck with the very large percentage of primiparæ, and the fact that the disease is at its height from three to four and one-half months.

Coffee ground vomit, due to disorganized blood, is shown to be a serious symptom in these cases. Esophageal pain is frequent. The combination of the two as an increasing amount of albumin in the urine should be indication for the serious consideration of operative intervention.

DO EXPERIMENTAL LIVER NECROSES AID IN EXPLAINING THE LIVER LESIONS OF TOXEMIA OF PREGNANCY?

Of the three theories of eclamptic toxemia based upon a biochemical foundation, the first is that of Viet, which assumes that the excessive influx of placental elements into the maternal circulation leads to the production of a cytolysin which is responsible for the morbid symptoms.

Ascoli supposes that the pathogenic changes and symptoms are due to this lytic substance—"syncytiolysin"—which is produced in excess of the amount needed to counteract the invasion by the fetal elements.

Weichardt's theory is based on the supposition that, in the dissolution of the wandering placental elements, an albuminous material is formed, a "syncytiotoxin" which is poisonous to the mother. In normal pregnancies this poison is immediately neutralized by an adequate amount of antitoxin; but in cases in which the formation of this antitoxin is absent or deficient, the poison prevails and gives rise to eclamptic toxemia.

The results of Leiptman and of Wormser and Lathardt who repeated these experiments, do not support these theories. These writers did not obtain the "syncytiolysis in vitro" described by Viet, Scholer, Weichardt and Opitz. Neither were they able to induce eclampsia in rabbits as Weichardt claims to have done by the direct introduction of placenta cells into the vein. Also, the results of subdural injections failed to confirm Ascoli's views.

Dienst, in a recent article on the causation of eclamptic toxemia, ascribes great importance to the action of the mother's blood serum upon the red blood corpuscles of the child. He obtained blood both from the umbilical stump and from the placental end of the cord at the time of labor, and determined the action of these *in vitro*. He also tested the permeability of the expelled placenta by the injection of milk and of the placenta *in situ* by injecting methylene blue at low pressure.

In all 118 women were examined. The maternal blood serum, in twenty-four cases, agglutinated and eventually dissolved the red blood corpuscles of the respective children. Of these twenty-four cases, fifteen had impervious placenta, a normal course and no albuminuria. Of the other nine, with pervious placenta, seven were eclamptic and two had albuminuria. He, therefore, reaches the conclusion that, to this agglutination and hemolysis, is due the condition of eclamptic toxemia, and that this can occur only when there is a free communication between mother and

child. Albuminuria occurs when the interchange is slight. He considers this action analogous to that of heterolytic sera; for example, he has seen in the liver of a rabbit after intravenous injection of human or dog's blood, changes similar to those caused by eclampsia. He states that there is not only a similarity, but an exact agreement between the clinical symptoms and the pathological lesions in both these conditions (eclampsia and transfusion with heterolytic sera). The hemoglobinuria is more marked in the experimental lesion.

In the study of experimental necroses of the liver, Pearce has shown that these lesions may be produced by the intravenous injection of hemagglutinins. The hemagglutinative sera were prepared by injecting the rabbit with various organs and fluids of the dog. The sera from these animals were then injected into the veins of the dog. These sera possessed the power of agglutinating the red blood corpuscles of the dog *in vitro*. The more powerful sera produced multiple liver necroses in dose of 1/1000 to 1/500 and in larger doses produced death in a few hours. The necroses developed in from 12 to 24 hours. They were usually widespread, closely massed and confluent. The surface of the liver presented a mottled appearance; small irregular yellowish brown or grayish yellow non-elevated areas, being sharply outlined by the deeply congested normal substance of the liver. Fine points of hemorrhage could be seen. The distribution of the lesions was superficial. All sera produce uniformly the same type of lesion, though not always the same degree of destruction.

Microscopically, the necrotic lesion involves the greater portion of a lobule, often the adjoining portions of several lobules. Frequently the necrosis is in the peripheral portion of a lobule, but, occasionally, the central and middle zones are involved; the altered area is frequently entirely surrounding the portal vessels. The necrosis is hyaline in character. Hyaline or conglutinative thrombi were found in the smaller portal veins and in the capillaries. It was possible, in serial sections, to demonstrate a relation between these thrombi and the necroses. The anatomic relation of the agglutinated red blood corpuscles to the lesion, in the absence of bacteria, phagocytic cell or fibrin thrombi, indicates that the necrosis is due to this obstruction of the smaller veins. Capillary thrombi may also occur in other organs, especially in the glomeruli of the kidney, periphery of the lung and in the adrenal with or without hemorrhage. Their occurrence, however, is infrequent in these places and is unaccompanied

by necrosis. The greater frequency of necrosis in the liver is supposed to be due to the slow circulation and narrow capillaries of this organ.

Flexner, who has described these thrombi in various lesions in man, speaks of the alteration in form, cohesion and staining properties of the red blood corpuscles. Every transition was found from normal red corpuscles to the main agglutinative mass, in which the corpuscular outline was lost and a higher degree of refraction occurred. He found these thrombi in several of the infectious diseases and in a *liver of eclampsia* in which the peculiar lesions (necrosis and hemorrhage) were abundant. The thrombi occurred in the neighborhood of areas of necrosis and hemorrhage.

The similarity of these experimental liver lesions to those of toxemia of pregnancy with vomiting and eclamptic toxemia, as described in the review of these conditions, is evident. The severity and extent of the experimental lesions depends upon the amount of the dose. Varying degrees of liver necrosis occur in toxemia of pregnancy as may be seen by reference to the lesions described by Opie and others. The periphery of the lobule is the seat of changes in experimental necrosis with moderate doses, while, with large doses, the middle and central portions are also attacked.

From the preceding review, it is evident that hemagglutinins, by the production of agglutinative red blood corpuscle thrombi, may cause experimental liver necroses. That the same mechanism holds for the liver lesions of eclamptic toxemia cannot readily be proven. The observations of Viet and others, however, concerning the presence of hemagglutinins in the mother's blood are suggestive. Moreover, in several eclamptic livers, which I have examined, these hyaline emboli, as described by Flexner, are to be found in direct relation to the necrotic areas.

There is evidence, therefore, that, in the toxemia of pregnancy, an agglutinative substance occurs in the blood and that this, by causing the clumping of red cells, leads to the occurrence of liver necrosis. It is possible that there may be, in addition, hemolytic and other toxic substances.

Dienst's experiments have added an additional argument in favor of this hypothesis by obtaining the hemagglutinin reaction *in vitro*, from the blood of eclamptics. His supposition that this hemagglutinin is formed in the fetus is weakened by Hitschmann's case of eclamptic toxemia, occurring in connection with

a four and one-half months' hydatiform mole, and by Behm's case and the case here reported, in both of which symptoms of toxemia persisted after the expulsion of the fetus and until the removal of the placental remains. However, there is no proof at present that such a hemagglutinin is produced by the placental cells.

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THE TREATMENT OF ECLAMPSIA.

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In order to treat any morbid condition rationally it is necessary to have a more or less clear conception of the cause and the course of the morbid process, since otherwise treatment must become merely symptomatic and be entirely palliative rather than curative.

Eclampsia is recognized to-day as one of the toxemias of pregnancy, the clinical course of the disease and the widely disseminated pathological lesions which are found at autopsy both tending to the same conclusion. The fact that it is limited in its occurrence to the pregnant state inevitably forces the conclusion that the particular toxin, or group of toxins, which give rise to the pathological conditions must in some way depend for its production on the development of the ovum and cannot be due to external conditions or infections.

These toxins must arise from one of three sources. They may be due to faulty maternal metabolism with accumulation of the abnormal products in the circulation; to abnormal conditions at the placental site, as infection; or they may be produced during the development of the ovum and pass into the maternal economy through the placenta.

That faulty maternal metabolism is not the source of the toxemia would seem to be proved by the facts that eclampsia is limited to the pregnant state, and that the removal of the products of conception, or the death of the child in utero, gives almost immediate relief from the severe symptoms in a large proportion of the cases.

Infection or other abnormality at the placental site may be eliminated for the same reason, since if the placental site, *i. e.* the uterine wall, were the seat of the morbid process, the absorption of the toxins could hardly be shut off promptly enough to give the marked change we see in at least one-half of the cases.

We are, therefore, forced to the conclusion either that eclampsia is a toxemia arising from the absorption of products of fetal metabolism in excess of what the maternal channels of excretion can eliminate under normal conditions, producing an intoxication from an overwhelming dose of toxins, or that an accumulation of toxins occurs owing to a lack of proper excretion of an amount which should ordinarily be cared for, producing an intoxication from accumulation. That both of these conditions may occur would seem to be proven by clinical observation, since we see, on the one hand, the eclamptic attack developing suddenly out of a clear sky in a patient who has shown no previous signs of a toxemia, and in whom the urine drawn from the bladder after the onset of the attack is free from albumin and contains a normal percentage of urea, proving that the intoxication was of sudden origin, while, on the other hand, the symptoms of toxemia may have been present for days, or even weeks, in neglected cases, according to the history, before the onset of convulsions.

The happy outcome of a prompt application of treatment, aimed at the elimination of the offending toxins, in a large majority of the cases who develop threatening symptoms, indicates that in many cases at least the intoxication is due to insufficient excretion rather than to an overwhelming dosage of the toxins, although a sudden increase in the absorption may at times apparently seem to prove the futility of all prophylactic measures in preventing the disease.

The next point to be considered is what effects the toxins produce. In a general way, all cases of eclampsia may be divided into two groups, hepatic and renal, according to whether the liver or the kidneys are most prominently affected. The distinction is probably a difference in degree rather than in kind, or else we are dealing with two distinct toxemias and are trying to classify them under one heading. The more severe cases, *i. e.* those which come to autopsy, show almost invariably the characteristic liver lesions described by Schmorl. These lesions may have been associated with symptoms during life, such as jaundice and tenderness over the liver, or there may have been no symptoms pointing to the liver involvement. The less severe cases belong to the renal type, are

seldom fatal if properly treated, and are characterized by a group of symptoms closely analagous to those of renal insufficiency. A close analysis of the two classes of cases and a comparison of the results of early treatment with those of late treatment give definite reasons to believe that the two types of cases differ only in the severity of the toxemia, and that the hepatic cases arise either when the system has received an overwhelming dose of toxins at the start, or when the early stages of the toxemia have been neglected.

The effects of the toxins are those of a strongly irritant poison; acting both on the nervous centers and on the tissues themselves.

The irritation of the cerebral and spinal centers results in the convulsive attacks, and in stimulation of the vasomotor centers to the degree that the excretory organs practically suspend their functions for the time being, owing to lack of material to excrete; and the irritation of the tissues is shown by the appearance of the albumin, blood, and casts in the diminished urine, and by the pathological lesions found at autopsy.

The great dangers to the patient are from failure of the circulatory mechanism; due either to the direct violence suffered by the heart during the tremendous changes in blood pressure induced by the convulsive attacks or to the exhaustion which may follow the extra amount of work thrown on the heart by the overaction of the vasomotor system; and from the rupture of a cerebral vessel during the convulsions.

The direct treatment of eclampsia must be devoted to the following objects: First, Removal of the source of the toxemia; Second, Relief of the heart by stopping the convulsions, and by relaxing the vasomotor spasm; Third, Securing the elimination of the toxins in the system; Fourth, The support of the patient until the desired results have been accomplished.

TREATMENT.

Before considering the curative treatment of eclampsia a brief consideration of the prophylatic treatment is in order, because there seems to be no question but that in the large majority, if not in all of the patients who show signs of a beginning toxemia, the development of eclampsia can be prevented by prompt and efficient treatment.

The prophylatic treatment may be briefly summarized as the prevention of any accumulation of toxins in the system, combined with the ordinary hygienic measures to maintain and improve the patient's general condition. The routine is simple and not burden-

some for the patient, and its principal object is the maintenance of free action of the excretory organs.

The bowels should be kept thoroughly open, and a diet should be advised with this object in view, the free use of fruit being especially to be recommended. Failure of nature in this respect should be met by the daily use of such of the mild cathartics as may be necessary, combined with the ingestion of large quantities of water, at least six glasses being taken between meals. The efficiency of this treatment may be distinctly increased by the periodic administration of calomel followed by a saline purge, once in three or four weeks, thus cleansing the intestinal tract and preventing the accumulation of any large amount of waste products.

The urine should be carefully examined at frequent intervals, and any suspicious signs should be met at once by a thorough flushing out of the system.

The appearance of albumin in a catheter specimen calls for increased watchfulness, and the development of signs of renal irritation for rest in bed, a liquid diet, and an attempt at the thorough elimination of the offending toxins, by means of free catharsis, diaphoresis, and diuresis.

The skin should be kept active by the use of daily baths.

The general condition of the patient should, of course, be attended to throughout pregnancy, and the attendant should be at pains to assure himself that the patient gets plenty of fresh air and such exercise as is suited to her individual needs and habits.

It is a matter of common experience that eclampsia is comparatively uncommon among women who are under competent observation throughout pregnancy, and there is little doubt that although it may be impossible to prevent the cases due to the sudden absorption of an overwhelming dose of toxins, the great majority of the cases can be prevented by careful prophylaxis.

The appearance of convulsions or the failure to effect a marked diminution of the toxemic symptoms calls for the immediate application of the most radical treatment since it is in the late cases that most fatal results occur. Treatment to be efficient must have four distinct objects in view: 1st. Prevention of further absorption of toxins by removal of the cause; 2d. Limitation of damage by the toxins already in the system; 3d. Elimination of the toxins;

4th. Treatment of the patient, as distinguished from the treatment of the disease.

1ST.—PREVENTION OF FURTHER ABSORPTION.

Although not susceptible at present of direct proof, there seems little doubt but that the toxemia is due to accumulation in the maternal system of waste products from the child, and the inference is clear that absorption can only be prevented by the immediate emptying of the uterus. My own experience with the Stroganoff treatment has convinced me that delay while attempting to suppress or limit the effects of the absorbed toxins simply serves to detract from or to absolutely destroy any chance of recovery that the patient may have. The observations of various writers lead to the conclusion that a large proportion of the so-called hepatic cases of eclampsia follow delay in emptying the uterus, while on the other hand the marked amelioration of symptoms which follows accouchement forcé in the majority of cases certainly indicates that the earlier the operation the better the patient's chances, although a considerable proportion of cases slight or moderate in degree will undoubtedly recover under purely medical treatment.

The method of operation to be employed in delivery must be adapted to the needs of the individual patient, but in general it may be said that the most rapid operation which is consistent with the safety of the patient is the most efficient. Mechanical dilatation of the cervix and immediate delivery has given satisfactory results in my hands. In cases with a rigid cartilaginous cervix, I believe that a vaginal Cesarean section may be sometimes indicated.

Abdominal Cesarean section, I believe to be inadvisable, except in cases which present the absolute indication, since I believe that an unnecessary abdominal operation on a patient whose excretory functions are already paralyzed by an overwhelming toxemia is irrational and adds to, rather than detracts from, the dangers already present. The slower methods of dilatation tend to increase the tendency to convulsions, and involve a considerable waste of time, and are never to be advocated.

Unnecessary laceration and surgical shock are, of course, to be avoided, but a moderate amount of post-partum bleeding is to be encouraged, the loss from 16 to 30 ounces of blood being of distinct benefit to the majority of patients.

The attempt to treat eclampsia without preventing the further

absorption of toxins is irrational, and the fact that a fair proportion of the cases recover without operative interference should not influence the treatment, since more lives will be sacrificed by the delay in applying active treatment and thus exposing the patient to the constantly increasing action of the toxins than will be lost in operative delivery.

The fact that the prognosis is better in post-partum eclampsia than in the ante-partum type and the beneficial effects which commonly follow delivery certainly support this view.

2ND.—LIMITATION OF INJURY.

The most important step in the treatment of eclampsia next to removing the source of the toxemia is to limit the damage which the toxins already absorbed can do. It is generally conceded that next to the pathological changes in the internal organs arising from the direct action of the toxins on the tissues, the greatest danger to the patient lies in the effect of the convulsions on the heart and in favoring cerebral hemorrhage, and the inference as to treatment is clear that the convulsions must be controlled until the toxins in the system have been eliminated.

The most efficient method of controlling the convulsions I have yet found consists in the subcutaneous injection of morphia, gr. ¼, in combination with the hydrobromate of hyoscine, gr. 1/100. The morphia may be repeated twice or three times at hourly intervals, as may be necessary, and the hyoscine once or twice according to the condition of the heart.

The effect of hyoscine, as a powerful spinal sedative renders it exceedingly valuable in these cases, not only in controlling the convulsions, but in relaxing the vasomotor spasm and thus favoring excretion of the toxins; but the effect of each dose on the heart action must be carefully watched, owing to its depressant action. However, in these cases its action in relaxing the vasomotor spasm relieves the strain on the heart to such a degree that in favorable cases the depressant action is almost abolished. The sedative action of morphia is too well known to require further comment, and its action in locking up the secretions seems diminished in eclampsia, probably on account of the vasomotor relaxation which it induces.

After the acute stage is passed the sedative treatment should be continued by the free use of chloral, until the appearance of free excretion shows that elimination of the toxins is going on, and that recurrence of the convulsions is unlikely. In many cases

chloral acts well without the use of morphia and hyoscine, but in others its absorption is slow and uncertain and the subcutaneous use of the sedatives is more satisfactory.

The use of chloroform or ether during a convulsive attack to lessen its severity is seldom or never productive of good, and may do harm.

Owing to the spasm of the respiratory muscles which develops during a convulsion it is hardly possible that sufficient anesthetic should be absorbed to affect the individual convulsion, and by the attempt to administer the anesthetic the small supply of oxygen which the patient can inhale at this time, the urgent need of which is shown by the congested or cyanotic facies, is cut off.

The administration of oxygen during the convulsions is strongly to be advised.

3RD.—ELIMINATION OF THE TOXINS.

Thus far the treatment has been directed to stopping the increase of the toxins in the system and to limiting the damage which they may do, and the next point to be considered is the elimination of those already absorbed. In the eclamptic patient excretion is almost at a standstill and the excretory organs seem to be paralyzed. This condition seems to me to have a double origin. The direct irritant effect of the toxins in the blood on the one hand, and a condition analogous to vasomotor spasm induced by the irritation of the spinal center on the other, combine to check excretion, and both must be relieved to render treatment efficient.

The irritant action of the toxins on the organs themselves is best minimized by the free use of normal salt solution, given either subcutaneously or directly into a vein in appropriate cases, to the point of toleration. This serves to dilute the toxins in the blood, and, combined with venesection, affords an efficient means of reducing the irritating action of the toxins by dilution. In cases which present marked edema or in which the heart action is very weak, the effect of the saline infusion must be watched carefully in order not to flood the system and increase the tendency to pulmonary edema. An initial dose of two quarts is usually well borne in any case, and it should be repeated according to indications. Bleeding is often of great value, even in cases where the pulse is poor, the removal of from sixteen to thirty ounces being often followed by distinct improvement, both in the symptoms and in the strength of the heart action.

The dilution of the toxins in the blood combined with the seda-

tive action of the morphia and hyoscine on the spinal centers is usually efficient in relaxing the vasomotor spasm and starting excretion, but the hypodermic use of nitroglycerine is also to be advised, since it acts as a direct vasomotor dilator.

The intestinal tract is the most important channel for the excretion of the toxins, although a considerable amount is eliminated in the urine; the action of the skin is comparatively insignificant. If the patient is unconscious and cannot swallow, or is under ether at the time of delivery, the introduction of one or two ounces of a saturated solution of Epsom salts into the stomach, by a stomach tube, will usually result promptly in copious watery discharges, though drop doses of Croton oil may be necessary to accelerate the action of the salts. This action, combined with the free injection of normal salt solution, results in washing the toxins from the blood and tissues into the intestine and rapidly removing them from the circulation. The urinary excretion is best stimulated by the repeated use of the saline infusion, followed later by the ingestion of large quantities of water or cream of tartar water when the patient is able to swallow.

The skin requires no special treatment, as sweating almost invariably starts up spontaneously when the other organs begin to act. Probably more patients have been sacrificed by well-meant attempts at forcing the skin action by the use of pilocarpine and hot air baths, resulting in cardiac exhaustion, than by any other method of treatment. The old rule that the patients who sweat may recover while those who do not sweat die, still holds true, since the appearance of free sweating announces the relaxation of the vasomotor spasm and the establishment of free excretion by all the emunctories; but sweating alone will not cure the patient.

The hot pack is harmless and soothing for a restless patient, but the hot air bath and the hot water bath are dangerous as well as useless.

4TH.—THE TREATMENT OF THE PATIENT.

It must never be forgotten in the treatment of a condition of such severity as eclampsia, and one which requires such radical treatment that the danger exists of treating the disease at the expense of the patient, and that we may at any time be called on to treat the patient for surgical shock or for failing heart action; that in any case our efforts may have to be directed principally to attempts to revive the failing heart action; and that in certain cases radical treatment is unwise on account of the surety that it will

kill the patient. In such cases the treatment must be directed to the patient's general condition and the disease allowed to care for itself. Free stimulation should be used whenever necessary.

AFTER-CARE.

For some days after recovery from an eclamptic attack the patient should be kept on a liquid diet so as to throw as little strain as possible on the overworked excretory mechanism. Absolute quiet and freedom from care are imperative, and free excretion should be maintained.

Sedatives and stimulants should be used as indicated. Nursing is permissible if the condition is satisfactory after the third day.

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ECLAMPSIA.*

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Eclampsia may be regarded as a result of autoinfection, its most constant symptom being albuminuria.

It has been estimated that eclampsia occurs once in five hundred pregnancies, and the mortality rate is likely to continue high until we know more of its etiology and pathology, and until prophylaxis receives that attention which its importance demands. Other toxins than urea must play an important rôle in the production of eclampsia. Albuminuria may be present in pregnancy and do little or no harm, while eclampsia will occur in those cases in which there is no albumin at all.

The toxemia that produces eclampsia is no doubt a mixed infection, consisting of the waste products from the liver and intestines, as well as from the kidneys. These toxins within the circulation of the mother may also be increased by fetal and uterine metabolism. Stern says that uremia alone is due to the electrical condition of the blood-serum, and that the product of metabolism is not highly toxic. That the toxemia is not due to one cause only is quite well proven by the fact that treatment directed toward elimination of the toxins is the most satisfactory.

In puerperal eclampsia renal insufficiency is usually an etiologic factor, albuminuria having nothing to do in its production. Ac-

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cording to the Traub-Rosenstein theory, cerebral anemia exists whether the eclampsia be produced by either central or peripheral irritation. It is also assumed that uterine contraction is an exciting cause, since an eclampsia will frequently occur during labor, yet contractions occur during the entire term of pregnancy, and the puerperium. Osthoff says that all cases of eclampsia have a reflex origin, as evidenced by the tense pulse, anemia of the nerve centers producing the eclampsia. "This theory as a working hypothesis renders intelligible what the uremic theory has failed to do, the occurrence of eclampsia without kidney lesion, the frequent presence of kidney derangement without eclampsia, and the special gravity of eclampsia when complicated by kidney derangement. In questioning the connection between uremia and eclampsia, the danger to life from the retention in the circulation of excrementitious material is in no wise disputed." (Lusk.)

Grandin has pointed out that, "as a rule, toxemia is least likely to occur in those subjects in whom albuminuria in moderate amount exists, while on the other hand, violent toxemia frequently occurs in subjects in whose urine albumin is absent, or present in trifling amount alone."

Notwithstanding the many theories as to the etiology of eclampsia, it is yet a mystery. That the toxins are in part produced by fetal metabolism is quite probable, because when the child in utero dies, or is expelled, convulsions usually cease. Engorgement of the blood vessels and the retention of urea must also be important factors. The system is overwhelmed with toxins and their sources of elimination are interfered with. The presence of albumin does not always mean renal insufficiency. While one woman in five hundred may have eclampsia, and many hundreds may have albuminuria, still in one hundred and eight cases of eclampsia reported by Gerster not one had albuminuria at any time during pregnancy. These facts can be reconciled with the belief that there is a causative relation between the condition of the urine in pregnancy and eclampsia. As the amount of urea excreted diminishes toxemia results. Urea is eliminated in health. In pregnancy there is increased production and diminished elimination. In a paper upon the subject, Morse of Washington, D. C., states that a healthy person eliminates 35 grams of urea in a day. If in a pregnant woman this amount is decreased, trouble is quite sure to follow unless the amount can be increased. The presence or absence of albumin, therefore, is not of as much consequence as we have hitherto believed, but the quantity of urea

in the urine much more accurately determines the pregnant woman's condition.

The physician's duty can hardly be said to be well done, who fails to estimate at regular intervals the amount of urea excreted. Not only is this neglected, as a rule, but even an ordinary urinalysis is too seldom made.

In a recent case in which this simple precaution had been neglected, a violent eclampsia occurred at the onset of labor. But little urine had been excreted for several days, and almost complete suppression had existed the previous twenty-four hours. Enough urine for examination was obtained by catheterization, and found almost solid with albumin. Though profound coma followed the first seizure, the patient recovered, with hemiplegia of the right side.

About six years ago another patient was seen in violent eclampsia. The urine had not been examined at all. Though she recovered, she still has albuminous urine, scanty at times, with decided uremic symptoms. Casts have never been found. She has since been pregnant, and from the time the urine was first examined until the end of pregnancy it was always found normal. No toxic symptoms were present, and labor was perfectly normal, soon after which albuminuria reappeared.

Both patients had been constantly under observation by their physicians.

Recent study of the toxemia of pregnancy by Professor Ewing of Cornell University Medical College leads him to regard the toxemia of pregnancy as a result of functional disease of the liver, resulting finally in hemorrhagic hepatitis, or acute yellow atrophy. Hemorrhage occurs in minute spots, and is present in all cases of acute fatal eclampsia at term, and in 95 per cent. of all cases of any variety of eclampsia. He also regards as secondary any disease of the kidneys or other organs, because the "synthesis of urea is exclusively a function of the liver."

Allen of Baltimore, Maryland, whose experience must have been varied, also looks upon the liver as the most probable cause of eclampsia, and says that as a rule urea is diminished, and yet a patient excreting 20 grams in twenty-four hours had eclampsia, while another excreting only 1.8 grams had no sign of eclampsia. He discredits the fetal source of the toxin.

The treatment of eclampsia naturally resolves itself into the prophylactic and the curative. In no other condition is prophy-

laxis more important, or attended with more gratifying results. When urea is diminished, elimination through the bowels, kidneys and skin should be encouraged, by means of saline cathartics, diuretics and diaphoretics. The hot air or vapor bath often gives good results. Cases in which there is diminished excretion of urea, scanty high-colored urine, precordial oppression, headache with or without impairment of sight or hearing, and a slow tense pulse, are usually immediately and often permanently relieved by free venesection. While venesection as a prophylactic is necessarily of limited application, still in appropriate cases its value cannot be overestimated. Should these means of relief fail, evacuation of the uterus should be seriously considered. When toxemia appears early in pregnancy, buttermilk to the exclusion of almost everything else is the best diet.

A patient, multipara, seven months pregnant, when first seen, was generally edematous, had severe headache and a slow, tense pulse, constipated bowels, scanty, high-colored urine, and precordial oppression. These symptoms had been gradually increasing for a month or longer, and were so urgent that time was not taken even for urinalysis, but a vein was opened and the blood allowed to flow until its loss was perceptible. Relief was immediate. Albumin, no doubt contained in the urine many weeks, constantly diminished; excretion of urea became abundant. The patient went to full term and was safely delivered. Not a single troublesome symptom appeared after venesection. Salines and diuretics were given as necessary, and, of course, may have contributed to the favorable outcome.

In another case recently under observation, venesection no doubt prevented eclampsia. The urine had been examined at intervals of three or four weeks since early in pregnancy. No albumin at any time, but diminished excretion of urea. At the seventh month not more than two to three ounces of urine was excreted within the twenty-four hours, almost solid with albumin. The patient had headache, dimness of vision, precordial oppression, a slow, tense pulse, a distressing hacking cough, and severe lancinating pains in both upper and lower extremities. She was edematous from her face to her feet, almost beyond recognition. A vein was opened, and 35 to 40 ounces of blood withdrawn. A softer pulse was the only sign of loss of blood. The next day the uremic symptoms had disappeared, the urine being more abundant. During the remainder of the term of pregnancy the patient's diet

was mainly buttermilk, and salines and diuretics were given as necessary. In about three weeks, however, the uremic symptoms again became so urgent that venesection was repeated. Marked improvement followed, and the quantity of urine increased to a pint within twenty-four hours. Labor came on two weeks later, and was completed within twenty-four hours. Uterine contractions were feeble, the breech presented, and though the os was fully dilated it did not engage readily. A foot was therefore brought down, and the child was speedily delivered, having the well marked symptoms of toxemia, which rapidly subsided on the appearance of the urinary secretion five days later, leaving the infant very thin and old-looking, and with a good-sized hydrocele. The good results from venesection do not controvert the theory of cerebral anemia, because its object is to relieve the brain from the action of the toxins, which are so promptly eliminated.

Should the patient be in convulsions when seen for the first time, or should she have had a convulsion, the indications of course point toward curative treatment. Under proper conditions, no remedy can be compared with venesection, its special recommendation being its promptness in the elimination of the toxins, thus rendering the system more susceptible to the action of other remedies. While veratrum veride may have its place in the treatment of puerperal eclampsia, that place surely is not as a substitute for venesection. Anesthetics, narcotics, and sedatives have their proper places. Morphine, however, would seem to defeat the main object sought, elimination by the kidneys. It should be given hypodermatically if at all. After venesection, calomel should be given in full doses, followed in due time by salines. Choral hydrate, sodium and potassium bromide, and irrigation of the colon with hot saline solution are all remedies of inestimable value. Intravenous infusion of normal salt solution, especially after venesection, is often of the greatest benefit. The toxins are thus diluted, and their elimination favored. The hot bath also has its appropriate place. Whatever the treatment, delivery should be accomplished at the earliest possible moment.

CONCLUSIONS.

A. The toxins producing eclampsia probably consist of waste products from the liver, intestines, and kidneys, augmented by fetal and uterine metabolism.

B. Renal insufficiency, rather than albuminuria, is usually an etiologic factor.

C. There is probably a causative relation between the condition of the urine in pregnancy, and eclampsia, because toxemia results when the amount of urea excreted diminishes.

D. Prophylactic treatment—encouraging elimination through the great emunctories—is usually successful.

E. Venesection in suitable cases is the best prophylactic.

F. The uterus should be evacuated when other means of relief have failed.

G. Venesection in suitable cases is the best curative agent because of its promptness in the elimination of toxins. Veratrum veride as a substitute is purely visionary.

H. Morphia has no place in the treatment of eclampsia because it hinders elimination by the kidneys and bowels.

INFANTILE UTERUS AND ITS TREATMENT, WITH A NEW OPERATION FOR ANTEFLEXION AND STENOSIS OF THE INTERNAL OS.

BY

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(With Five Illustrations.)

THE gross anatomy of the uterus is too well known and too easy of access to require rehearsal. The histology of that portion of the uterus which participates to the greatest extent in menstruation, the endometrium, may be reviewed with profit in this connection. The endometrium lines the uterus throughout and is connected with the inner surface of the musculature, with no intervening basement membrane, the two structures being somewhat interwoven. The free surface is covered with a layer of ciliated columnar epithelium whose individual cells are lower in the corpus than in the cervix. This surface epithelium is seen to have cone-shaped depressions, in the apex of which are found the mouths of the utricular glands. A cross section of the uterus shows the endometrium to be composed of numerous tubular glands and an interglandular substance. The glands run perpendicularly or obliquely to the surface toward, and some of them

into, the musculature. They are lined with the same form of epithelium as covers the inner surface of the endometrium. The interglandular stroma (the "lymphoid tissue" of Nagel, the "embryonic tissue" of Minot, the "adenoid tissue" of Johnstone), consists of numerous oval cells about the size of leucocytes, which during pregnancy develop into what are known as decidual cells, and running between these cells is a fine connective tissue reticulum. Many blood vessels approach the endometrium through the musculature, which, at the base of the endometrium, break up into fine blood vessels. These, after traveling a short distance into the endometrium, break up into capillaries and are distributed freely to the endometrium. The endometrium is also well supplied with lymphatics, and indeed, Leopold chooses to look upon the endometrium as a broad lymphatic gland. The nerve supply is derived from the cerebrospinal and the sympathetic systems. Von Herff and Gawronsky not only describe ganglionic cells in the musculature, but Gawronsky has traced the nerve fibers into the epithelial cells of the endometrium.

NORMAL MENSTRUATION.

It is not within the scope of this paper to discuss the theories regarding the cause of menstruation, nor to review the different opinions as to what takes place during the process. It is merely my wish to describe briefly, yet as definitely as possible, the changes which have been seen to take place by such reliable observers as Moericke, Gebhard, Kundrat, Engelmann, Williams, Cullen, Bland-Sutton, Johnstone, Findlay, Abel and others. The pelvic organs become congested and enlarged, the uterine tissue is swollen and softened, and its walls are less rigid. Microscopically the endometrium is found much thickened. The epithelium is swollen, the blood vessels are engorged with blood, and later the distention becomes so great that the blood is forced out into the tissues, either by rupture of the capillary walls or by diapedesis. The blood is seen forming extravasations in the tissues, crowding the "lymphoid cells" to one side, collecting under the epithelium upon the surface and that lining the glands; and as the process continues, the blood, following the lines of least resistance, is forced between the epithelial cells into the gland tubules, and between the surface epithelium directly into the uterine cavity. During this process some of the epithelial cells are loosened, as are also some of the lymphoid cells, and are carried off with the blood. The menstrual fluid is then a composite

substance, containing blood, mucus, lymphoid substance and detritus. Under normal conditions, coagulation is prevented by the presence of the lymphoid substance. (Gilliam, Pryor and others). Heape, however, speaks of clots always being found in his examinations of the uteri of menstruating monkeys. We should keep in mind that this congestion and shedding is a physiological rather than a pathological process, that the flow follows a series of preparatory changes. The uterus and the system are "ripe" (Gilliam), so to speak, for the process. The uterus is prepared for this first, by its development at puberty, the body enlarging and developing, the cervix broadening and becoming comparatively shorter, and the canal becoming sufficiently patulous. Secondly, the uterus goes through the monthly preparation, becoming shorter and the canal more patulous. The endometrium also undergoes development previous to and after puberty, and also this monthly preparation. Normal menstruation requires good blood, a healthy, well-developed uterus, a uterus ripe for menstruation, healthy pelvic organs, a nervous system free from abnormal stimulation or depression, free from hypersensitiveness, and absence of circulatory disturbances.

With this conception of menstruation and the preparation for the process, it is not difficult to see that this physiological congestion could be changed, under slightly abnormal conditions, into a pathological one with resulting dysmenorrhea, systemic disturbances, reflex neuroses and a sequence of pelvic pathology.

THE INFANTILE UTERUS.

At birth, the uterus is characterized by a small body with thin walls, a comparatively long, large cervix, with an hour-glass contraction and anteflexion at the junction of the body with the cervix. Johnstone, Kundrat and Engelmann have recorded observations showing that the endometrium is in an undeveloped condition at birth, being thin, with few lymphatic cells, the epithelial cells not well developed and the glands absent. Minot also calls attention to the absence of glands at birth. Engelmann places the time of appearance of these glands at the third or fourth year of age. Wyder has shown that the time of appearance is variable. Johnstone's observations upon three cases, one at the age of eleven, one at the age of thirteen after two menstrual periods, and one at the age of twenty, are particularly interesting, as showing the gradations of development. The uterus gradually prepares itself for activity during the growth of the child, but

just before and at puberty this developmental process reaches its highest point of activity. That this process of enlarging, broadening out, of increase in musculature, of growth and development of the whole uterus is retarded or arrested, is a matter of common observation. That the endometrium partakes in this non-development, and that, therefore, the characteristics of an organ fitted only for inactivity are carried over to a period of forced activity, cannot be doubted. But should there be skeptics, we have the convincing proof of the recorded observations of such investi-



Fig. 1. Showing the anteflexion, the dotted line shows the superior and inferior limits of the incision.

gators as Kundrat and Engelmann, as well as Johnstone. Kundrat and Engelmann give the results of their co-labors in separate papers. They not only call attention to the undeveloped condition of the constituents of the endometrium, as stated previously, but Engelmann says: "It (the mucous membrane), possesses this same formation in uteri of incomplete or retarded development, which macroscopically also resemble that of the child in the flat, hour-glass shape, and in the prominence of the cervix. All these elements, as well as the ciliated epithelium which lines the surface,

are more delicate than in the fully developed uterus. The essential difference between this and the infantile womb, however, is in the glandular structure."

Wylie says: "The symptoms in anteflexion are due to the degenerate, hyperesthetic, and more or less constricted or stenosed condition of the tissues at the internal os." And further, "The true morbid condition of the uterus in most cases of anteflexion is one of imperfect development, while the uterine canal is more or less stenosed by the degenerate and contracted state of the uterine tissues, and the mucous lining is degenerate and atrophied, often hyperesthetic, especially in that part of the organ where the circular fibers are most powerful and contracted, at the internal os."

Wylie also calls attention to the resistance offered by the constriction at the internal os, to the introduction of a sound, as well as the extreme tenderness at this point. Shoemaker calls attention to the sensitiveness of an area at the internal os, "which, in the presence of escaping fluid or a foreign body, causes pain and spasm of the circular fibers at this point." Emphasis has also been laid upon the theory that such an undeveloped uterus is supplied with vitiated nerve endings, which are over-sensitive in responding to minor insults. The writer has repeatedly demonstrated the fact that a sound which would easily pass the external os, would meet resistance at the internal os. Wylie suggests a possible explanation of the cause of dysmenorrhea in some cases being the closure of the canal by a swelling of the mucous membrane during menstruation. Herman combats this theory, and offers as evidence the results of his measurements taken in a series of cases during and between the menstrual periods, which showed the cervical canal to be enlarged at this time. He also speaks of constriction at the internal os. While the whole cervix softens and enlarges under normal conditions, there seems no reason to doubt the possibility of the lumen being decreased by swelling should an abnormally resistant cervix not soften as rapidly as the mucous membrane.

Wide variation is noted in the cause, in the extent of, and the disability produced by this pathological condition. But as a result of the evil influences of heredity and environment under which girls are brought into the world and grow up, the developmental process is retarded in increasing numbers. In these undeveloped uteri, menstruation may be absent, or what is more common, instead of being a normal process, it becomes a disease-

producing process. The uterus having failed in its preparation at puberty, now fails in its monthly preparation. The uterus, with its undeveloped musculature, long, narrow cervix and constriction and anteflexion, does not so readily soften and allow of ready

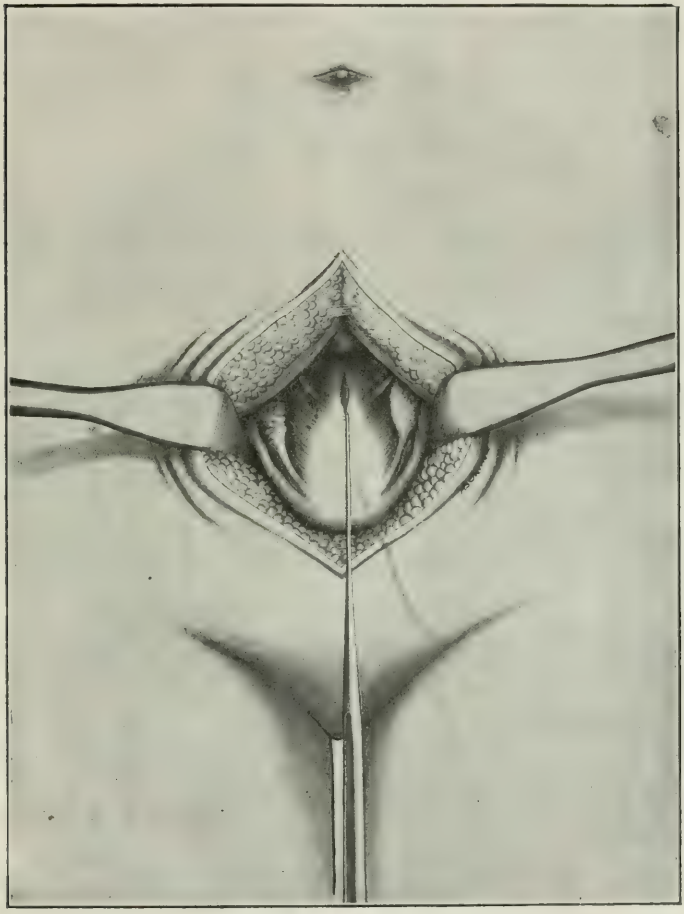


Fig. 2. Showing the uterus drawn up with the tenaculum and the longitudinal incision over the point of flexion.

escape of fluid from the uterus. As a result of the undeveloped endometrium, the blood meets with greater resistance in getting into the uterine cavity. As a result of the undeveloped lymphoid substance, clotting sometimes takes place, and the mechanical difficulty is increased thereby.

Should the Born-Fränkel theory be further substantiated, and should the corpus luteum be found to play the important part in the preparation of the uterus for pregnancy and menstruation that the experiments set forth by Fränkel would seem to indicate, and should it be the secretion of this ductless gland that prevents the uterus reverting to the infantile type, or hurrying on toward senility, as suggested by him, then this is to play an important part in our conception of the cause of hypoplasia of the uterus, either of the infantile form or of the hyperinvolutions, with their consequent degenerations, flexions, constrictions and resulting dysmenorrheas. And should the preparations from the corpus luteum taken from the ovary of the cow or other animal prove a substitute for this internal secretion, this form of animal therapy would have a large field of usefulness in the prophylactic treatment of the infantile uterus and the resulting dysmenorrhea, as well as other uterine disorders. This, however, is in the experimental stage and only problematical. At best, it could not be hoped that it would remove the organic lesion in the uterus, when once developed.

Much controversy has arisen as to whether or not mechanical obstruction is an important factor in the etiology of dysmenorrhea. That dysmenorrhea is present in these cases needs no argument; that it is thought to be caused by obstruction is evidenced by the numerous operations and procedures devised to correct the difficulty; that the undeveloped endometrium itself is a factor in the causation of dysmenorrhea and that it is partly responsible for the mechanical obstruction, is now widely believed.

Looking to the prophylactic treatment, we would want to give the young girl healthy parents and healthy parents' parents, and to bring her up in an atmosphere of mental equilibrium. We would want her free from confining occupation, with bad air, lack of sunlight, etc. We would want her educated in a school that recognizes the limitations of a girl at puberty, and in one that counts the physical health of the girl far above perfect attendance and high standing in competitive examinations. That high pressure existence in school and out which young girls encounter at puberty and during early menstrual life, is responsible for many a bankrupt future. Young girls should not be allowed to drift along with chlorosis or any condition below par month after month, but should be kept in the best possible physical condition. They may later overcome the anemia spontaneously, but only after serious damage to the pelvic organs has been done.

After the uterine development has been arrested or retarded, every effort should be made to correct the difficulty. Too frequently the dysmenorrhea is considered the sole error, and trouble is taken only to carry the patient through this period, while the

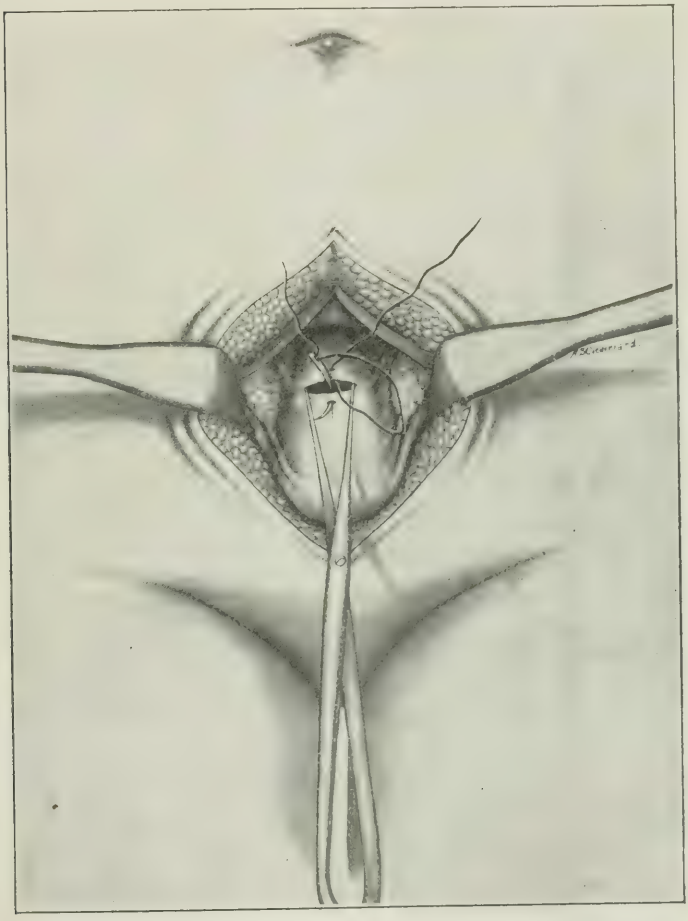


Fig. 3. The original longitudinal incision converted into a tranverse one.

facts are that a sequence of pelvic lesions—more disease of the endometrium, chronic metritis, salpingitis, oophoritis, displacements, etc.—follows, which is made more permanent with each year of life. Early recognition, and as far as possible correction

of menstrual disorders, is imperative. Displacements should be corrected; nerve tension should be decreased; right living instituted; baths, exercise, diet, out-door life, etc., should receive our attention. Early marriage, with its legitimate sequence, child bearing, should be hailed as a boon in these cases of arrested development. It requires wifehood and motherhood to develop some women, and especially their pelvic organs. Everything else being equal, we should hear much or little of the infantile uterus according as late or early marriage is the rule. In early life the lesion is frequently not so great but that pregnancy may follow marriage, and the trouble be ended. In patients who have endured these troubles until twenty-five, or thirty, or more years of age, the pathological changes have developed until sterility is the rule, and we are deprived of the best means of cure. Strenuous competition with men and the efforts to avoid the pangs of childbearing, and the responsibilities of motherhood undermine the health of women. Contented domesticity, with early, willing, happy maternity, leads to their health and usefulness. May future generations be spared "higher education" if health is to be the price and invalidism the result.

The treatment of a patient with an infantile uterus should look to the individual health of and harmonious working of all organs, the correction of the perverted nervous system, the preservation of energies being dissipated, the correction of vitiated metabolism—in short, the best possible condition of health should be brought about. The local treatment should look toward the development of the uterus, the lessening of congestion, the straightening of the uterus, the enlargement of the cervical canal, the lessening of all peripheral nerve irritation, etc. Tampons and hot douches have their place. Massage, as recommended by Brandt, is sometimes useful, but should not be used in many cases, especially in unmarried girls. Dilatation of the cervix, as recommended by Mackintosh, oft repeated, with clearing the cervix of the mucous plug, sometimes lessens dysmenorrhea and has in a few of the writer's cases allowed pregnancy to take place. The stem pessary, brought forward by Greenhalgh, has largely fallen into disuse, but is still used by some (Carstens).

From the standpoint of the surgeon, there are several points of interest in an infantile uterus: First, a long, constricted cervix; second, a diseased endometrium; third, anteflexion; fourth, a muscular, fibrous, membranous or musculo-fibro-membranous constriction at the internal os, and possibly a spasmodic

stricture at this point. Associated with these primary conditions, we may have retroversion and more or less disease of the adnexa. Stress has been laid upon a pin-hole external os, but the constriction at this point is slight as compared with that at the internal os. One may be called upon to deal with one or many of these conditions.

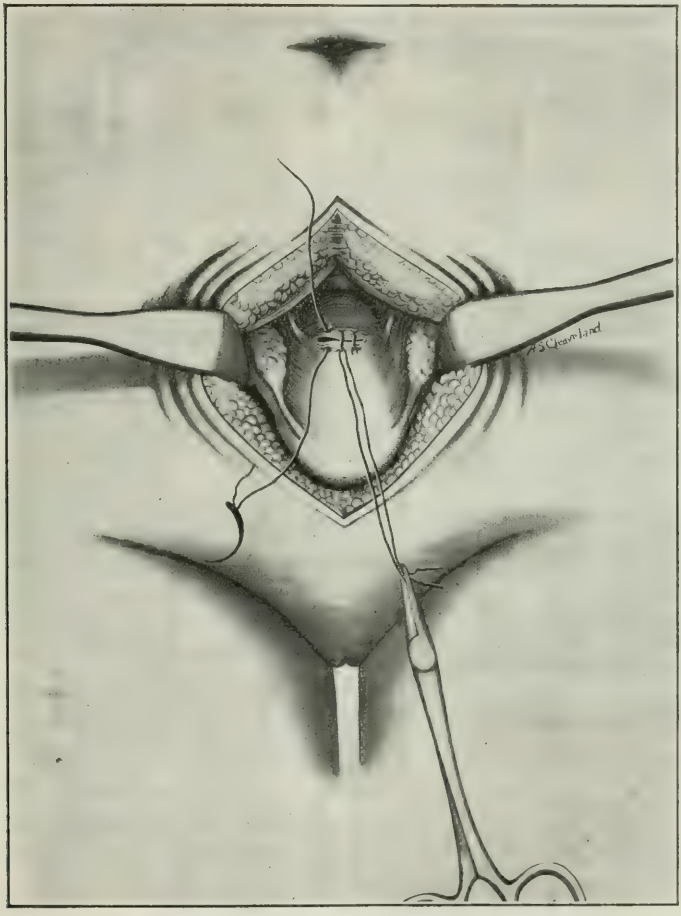


Fig. 4, Showing the sutures being placed.

Forcible dilatation of the cervix is recommended by Ball, Ellinger, Goodell and others. This is usually helpful and occasionally all that is necessary. The good effects of this treatment are ascribed by some to the resulting paralysis of the cir-

cular muscle fibers, and by others to the crushing of sensitive nerve endings at the internal os. Curettage is often desirable in addition to the above treatment. If the cervix is unusually long, and especially if cystic degeneration has taken place, amputation may be desirable, and is easily accomplished by the Newman method.

To relieve the marked constriction at the internal os, this has been cut from within by means of a probe-pointed bistoury, but this procedure has never become popular. Sellman recently described an operation of, and instruments for, reaming out tissue at the internal os.

Owing to the conception that the external os was at fault, as well as the whole canal, several operations have been done with a view of enlarging this opening, namely, the bilateral incision of Simpson, the posterior incision recommended by Sims, the bilateral incision with sewing of the lips to the anterior and posterior walls. Simpson carried his bilateral incision high enough to incise the internal os when thought desirable. Sims made the posterior slit in the lower part of the cervix, and an anterior slit at the internal os at the point of flexion. Dudley makes a posterior incision of the lip of the cervix, takes a V-shaped piece from the cervix on each side of the incision, then folds the lower portion of the cut surface over the upper, so as to do away with the raw surfaces left in the previously mentioned posterior cut. These wounds in the cervix, if kept open, lessen the distance through which the fluids have to travel in the constricted cervical canal, and if carried above the internal os, lessen the constriction, but they do nothing towards straightening the uterus. If carried high, they have proven somewhat dangerous.

Thiriar recommends in some cases opening the abdomen and performing what he calls cuneohysterectomy. This is the removal from the posterior wall of a wedge-shaped piece of sufficient size to correct the deformity of anteflexion; but this does nothing with the stricture at the internal os. Reed cautions against going into the canal, and calls attention to the possibility of considerable hemorrhage in this operation.

The writer wishes to present a method which he has been using the last one and one-quarter years, for the correction of the anteflexion and the constriction at the internal os (Fig. 1), be it muscular, fibrous or membranous. The uterus is first dilated, and if necessary curetted, and should great elongation of the cervix exist, the cervix is amputated, as mentioned above. The

abdomen is then opened in the median line, and the uterus is brought up and held with a tenaculum placed just above the flexion at the internal os. A longitudinal incision is now made over the internal os (Fig. 2), its length corresponding with

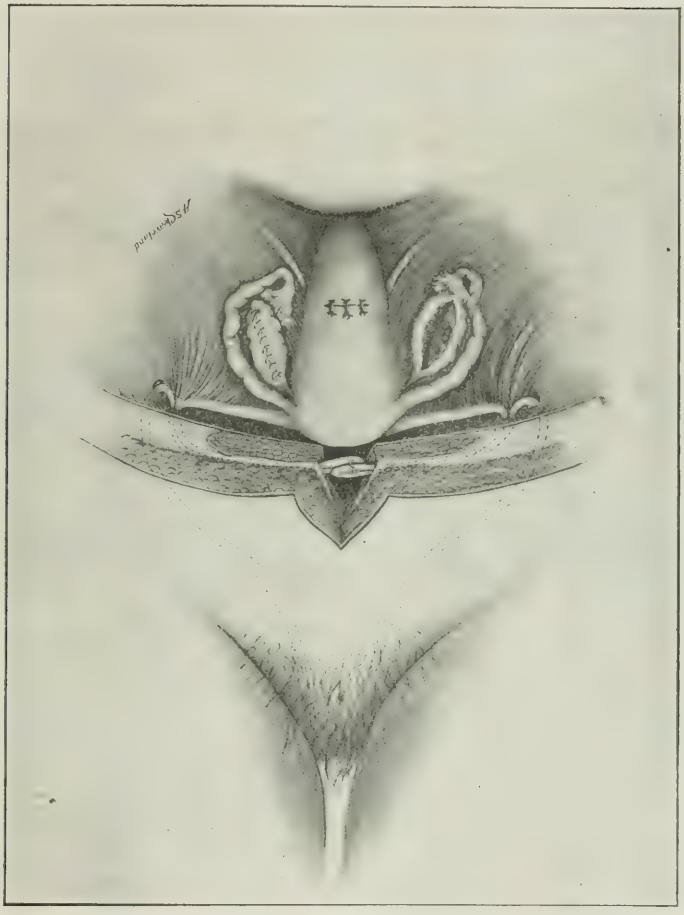


Fig. 5. Showing the completion of the operation for flexion and also the author's operation for retroversioflexion.

the extent that the posterior wall needs shortening in order to straighten the uterus. The author's tenaculum forceps is now used to change this longitudinal slit into a transverse one (Fig. 3), broadening the cervix the length of the slit, and shortening

the posterior walls to the same extent. A median suture is placed while the forceps holds the incision transversely (Fig. 3), and at the same time holds the uterus up. The forceps is then removed, and one or two sutures are placed on each side of the median suture, as needed (Fig. 4). This procedure allows the cut ends of the circular fibers to be displaced to the side so that they are 1½ to 2 cm. apart, outside measurement, so that the circumference of the uterus is materially increased, and the constriction obliterated. The incision may be carried as deep into the cervical tissue as may be desired, into the canal, in fact, if a membranous stricture exists. The incision, however, grows shorter as it goes inward toward the canal (Fig. 1). In each of the writer's cases, there has been retroversion connected with the anteflexion. It has also been necessary to remove a portion of one or both ovaries.

Case I. is typical, except for the pneumonia which followed. Mrs. Q., age 34. Menstruation began at the age of 14; never regular; now very irregular, intervals varying from one to eight weeks. Menses last five to seven days, amount variable. Clots are passed at times of menstruation, preceded by severe cramping pain. Pains most severe the first and second days. Patient complains of severe pain in the inguinal region. Patient married 12 years, no children, no miscarriages. Has had more or less leucorrhea since marriage. Is failing in health and strength, and able to do only a slight amount of work. Is losing weight, has a haggard, melancholic look, and is becoming more and more nervous. Menses almost unendurable.

Examination revealed a firm, gristly uterus, with the most marked case of anteflexion that has come under the writer's observation, together with retroversion and moderately enlarged and prolapsed ovaries. Operation was advised and accepted. When the patient entered the Marion Sims Hospital, she was just recovering from an attack of tonsilitis and laryngitis, which had given her only slight trouble a day or two previous. The next morning the difficulty had so cleared that it was thought no drawback to the operation. The uterus was thoroughly dilated and curetted, the abdomen was then opened, and the above-described operation performed. The most diseased portion of each ovary was resected, and then the author's intramural transplantation of the round ligaments for retrodisplacement was performed (Fig. 5). The patient survived the operation with almost no shock, but the next night developed an embarrassed

respiration, and the following day showed a well-marked double pneumonia. Fortunately, however, it ran a typical course, was only moderate in severity, and ended favorably without any unpleasant complications. There was almost no abdominal disturbance.

Theoretically, the operation should straighten the uterus, and do away with constriction, which has been found very marked when an attempt was made to introduce the sound and dilators into the uterus. It was then with considerable interest that I examined the patient one week after the operation, and on this and several subsequent occasions found the uterus in good position and straight. The menstruation following the operation came on without the patient's knowledge until the blood appeared. She has since repeatedly reported her menses painless, and has regained her accustomed weight. Re-examination on January 18 finds the uterus straight and normal, the fundus well forward, and the menses are still reported painless.

There is no desire to ascribe to this one procedure the credit which belongs to several operative procedures, in producing the good results obtained in this and subsequent cases. The writer wishes to put on record an operation which he has seen fit to term hysteroplasty, which has left no doubt of its ability to correct two of the pathological conditions in infantile uterus, namely, the anteflexion and stricture, and a procedure which, in selected cases, may be employed with other procedures to overcome the troublesome dysmenorrhea due to this frequent pathological condition.

Perhaps no question would be raised so frequently in connection with the operation as that bearing upon its effect upon the uterus in future pregnancies and deliveries. When we think of Thiriar's operation of cuneohysterectomy, of Cesarean section, of myomectomy, of the removal of the wedge-shaped piece of the uterus for chronic metritis, of Kelly's abdominal curettage and search for buried fibroids, this slight longitudinal incision ceases to be objectionable.

In the absence of other pelvic lesions, and in cases with a sufficiently roomy vagina, the vaginal route might be chosen, but when it is remembered that anteflexion only occasionally exists in women who have borne children, and that frequently this pathological condition is accompanied by lesions of the adnexa, it will be seen that the vaginal route should seldom be selected. This operation is to be chosen not in all cases of infantile uterus and

anteflexion, but in those in which the disability is of sufficient weight to warrant the celiotomy and the leaving of a slight abdominal scar.

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100 STATE STREET.

THE MORTALITY OF OPERATIONS, OTHER THAN STRUMECTOMY, IN CASES OF EXOPHTHALMIC GOITER, WITH SPECIAL REFERENCE TO GYNECOLOGICAL OPERATIONS.*

BY

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A SURGEON might at any time be asked the question recently put to me by the husband of a patient with an adherent retroverted uterus: What additional risk must be incurred if an operation is

[1] Read before the American Gynecological Society, May 27, 1905.

performed upon a woman suffering with exophthalmic goiter? Hitherto it has been impossible to answer this question precisely. No one has had sufficient experience with this complication to express an opinion, and the only literature bearing upon it, as far as I know, is the excellent paper of S. E. Sanderson, in which, however, it is stated that only six cases could be collected.

To learn the collective experience of American surgeons, 366 letters were dispatched to the members of the National Societies of Surgery and Gynecology. Two hundred and forty-seven answers were received. One hundred and sixty-seven replied that they had had no experience with this complication of surgical operations. Eighty stated that they had had experience, but a number used the indefinite expressions of "a few, several, and three or four cases." Therefore, their statistics are not included. Forty-four surgeons reported 71 cases definitely. This number added to the six collected and reported by Sanderson, makes a total of 71.

The following operations were performed:

7 "Abdominal sections."
13 Hysterectomies for fibroid tumors.
2 Myomectomies.
2 Vaginal hysterectomies.
1 Pelvic abscess.
1 Tonsillotomy.
6 Salpingo-öophorectomies.
4 Breast amputations.
1 Extraction of teeth.
6 Dilatation and curettage.
7 Appendectomies.
13 "Minor operations."
1 Amputation of the arm.
6 Plastic vaginal operations.
1 Cholecystotomy.
1 Plastic and suspension of the uterus.
1 Stretching of the sphincter.
1 Salpingectomy and suspension of the uterus.
1 Abdominal section for adhesions and partial obstruction of the bowel.
1 Suspension of the uterus complicated by adhesions.
1 Exploratory section for papilloma of the pelvis (probably malignant).

Of this number, 15 died. The operations which ended fatally were:

"Abdominal section"	1
"Minor operation"	1
Appendiceal abscess	1
Hysterectomy	2
Vaginal Hysterectomy	2
Amputation of breast	2
Tonsillotomy	1
Oophorectomy	2
Extracting teeth	1
Salpingo-öophorectomy	1
Pelvic abscess	1
	15

In 13 of these fatal cases the cause of death is expressly stated to be acute thyroidism, with tachycardia to an extreme degree, and eventual heart failure. In one case (appendiceal abscess), the patient died of the combined effects of sepsis and thyroidism. In another (pelvic abscess), the patient died under chloroform before the operation was begun. Excluding these two cases, the mortality from thyroidism was 16.8 per cent., or including them, 19.4 per cent. The character of the operation seems to have made little difference in the results. The mortality of the minor operations was 16 per cent.; that of the others about the same. It appears, therefore, that the existence of exophthalmic goiter adds more than 15 per cent. to the mortality of any operation performed upon the patient.

Consequently an operation of election, such as suspension of the uterus or plastic operations in the vagina should be considered unjustifiable on such patients unless a preparatory or curative treatment is discovered that will lessen the danger. Local anesthesia may be demonstrated to be preferable to general anesthesia, but while the subjects of exophthalmic goiter cannot be said to take an anesthetic well, the alarming symptoms of acute thyroidism do not, as a rule, appear during or directly after the anesthetic, but usually at the expiration of a day or two when the effects of the anesthetic have worn off.

Possibly the best results may be obtained with Barker's method of employing adrenalin chloride and β eucain.

It must occasionally be the unpleasant experience of a surgeon to have an operation forced upon him despite the existence of ex-

ophthalmic goiter. Such was the case in my operations, one a myomectomy for uncontrollable metrorrhagia, the other a salpingo-öophorectomy with drainage for virulent streptococcic puerperal infection. Both women recovered. In the first patient there had been a distinct goiter and exophthalmos for years, but the tachycardia was moderate. The symptoms in this case were never very alarming and soon yielded to treatment. It was not known that the second patient had Graves' disease until two days after the operation, when the pulse rose to 180, the eyes protruded, and the throat swelled. We then learned that since girlhood the woman had been subject to such attacks, but lately had been free from them. Although some improvement was shown after hypodermoclysis, purgation and heart stimulants, on the first day that symptoms appeared, a rapid and complete recovery was secured, in the next three or four days, apparently in consequence of the administration of suprarenal extract in three-grain doses every four hours. Of all animal extracts, this appears to be most antagonistic in its physiological action to the thyroid juice, and one would naturally expect it to control the symptoms of acute thyroidism. There is, of course, danger of a *post hoc propter hoc* logic if conclusions are hastily drawn from such a small experience, but there seems to be reason to give this remedy a further trial. Intravenous injections of adrenalin chloride may prove more efficacious than the suprarenal tablets by the mouth, and in the presence of urgent symptoms this method of administration would be my choice in the future.

For the courteous assistance of the gentlemen who enabled me to prepare this paper by contributing their experience, I desire to express my gratitude.

1821 SPRUCE STREET.

THE MORTALITY IN OPERATIONS UPON FIBROID TUMORS OF THE UTERUS.*

BY

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RECENT papers on the Degeneration of Fibroid Tumors of the Uterus, such as those by Noble, McDonald, Frederick, Hunner, and others, in which claims are made for such large percentages of

* Read before the American Gynecological Society, May 27, 1905.

various degenerations and on account of which the general deduction is drawn that all fibroid tumors of whatever character should be removed, are apt to set one thinking as to other factors in these cases which may bear on the final conclusions to be adopted.

My own experience in these matters differs quite materially from those expressed by Noble in his paper read before this Society at its last meeting. In the first place I have been so fortunate as not to see such a great number of degenerations in these tumors. What looks like a degeneration at times to the eye proves quite otherwise under the microscope and I may add that I have on several occasions had in my operating room such degenerations called to my attention, have disputed the accuracy of the observation and on section and microscopic examination have satisfied those concerned of the correctness of my view.

Furthermore, degeneration of the tumor does not of necessity imply either symptoms or danger. Calcareous degeneration is probably one of nature's efforts to destroy the tumor and in its results is practically harmless—it certainly in my experience adds no extra risk to the patient. In no case of cystic degeneration of a fibroid tumor have any symptoms other than those which usually obtain in such growths been observed by me. Myxomatous and hyaline degenerations are chiefly of interest pathologically; clinically in my experience they are not of much importance. So much is this so that no one has, unless in a rare case, ever suspected their existence until after the operation. Much the same holds true of edema. Necrosis and malignant degenerations are the exceptions. Even here my sympathy is largely with Bland Sutton's assertion that many cases of supposed sarcomatous degeneration of fibroid tumors have been sarcomas from their inception.

Looked at from this standpoint (and one is justified in being governed by their own experience rather than by that of others whose observations they have been unable to personally verify) the estimate made by Noble that 16 per cent. of 1,188 cases considered would (without operation) have died because of the degenerations in the tumors, is pure guesswork, and consequently too inexact to be accepted as a fact. His further assertion "that at least a third of the women having fibroid tumors would have died had they not been submitted to operation," is gratuitous and consequently misleading as applied to the dangers of fibroid tumors. Because a woman happens to have a ventral hernia, a carcinoma of the umbilicus, an appendicitis, a tuberculous peritonitis or some other of the many complaints mentioned by him is

no reason for considering the fibroid tumor of the uterus dangerous. Nor can any living man even approximate the percentage of "intercurrent diseases brought about by the chronic anemia present in many of the cases." It might even with some degree of safety be questioned whether this ever occurred; at any rate, we have at present only assertions of this, but no reliable data as proof. As to the "injurious pressure from the tumor upon the alimentary canal and urinary organs" I have long been convinced that this is largely a myth. While I in some measure reach a similar conclusion as do these gentlemen as to the advisability of operating upon a large proportion of fibroid tumors which come under my observation, I do so largely, as does Deaver, from the standpoint of symptoms and likewise from that of prognosis as influenced by the remote results of operations—not from any fear of the degenerations and their consequences. Like Sturmdorf in attempting "to establish the indications for radical operative interference" of this condition, I never lose sight of the remote, as well as the immediate, results of the procedure, and in doing so am shocked at the estimates of danger we constantly observe put forward by surgeons. Sturmdorf in summing up the results of operative treatment for this condition states that "no woman afflicted with uterine fibroids and subjected to modern operative technic should lose her life—*if operated at the proper time.*" Gordon tells us "the mortality was so small that one could hardly estimate it in connection with this operation." Noble declares "his own opinion about the mortality was that if operation was done early it was about 1 per cent." And so with a large number of others.

It is true that few operations are on a more sure and easy basis than hysterectomy for fibroid tumors of the womb, if we consider the immediate result and the technique only. Under these circumstances the above estimates are not far from correct. And so it is the remote results as far as mortality is concerned which are of most importance. These it is which have taught me that radical operative procedures on fibroid tumors of the womb are the most dangerous operations I have to perform, and which cause me more anxiety after my patients are apparently well convalescent than all the other operations I am called upon to perform.

Whitridge Williams, in discussing Noble's paper last year, asked an exceedingly pertinent question and one which remained unanswered, the answer to which is of vital importance in mortality estimates. He asked "if in this large number of cases there had been a number of cases of thrombosis of the pulmonary vessels

with fatal pulmonary embolism." So far as he had been able to learn a fibroid tumor sometimes produced a condition which favored thrombosis in the pulmonary vessels." No one else in the whole discussion seemed to think the subject one worthy of mention, either before or after their attention had been directed to it by Williams. Likewise, in a long discussion before the New York Obstetrical Society on "Causes of Death Following Abdominal Operations," but one man (Mallett) considered the subject worthy of mention.

That embolism has to a degree been recognized as a danger peculiar to fibroid disease is clear. Deaver, in a recent paper, states "the great frequency of myocarditis and arteriosclerosis apparently directly caused by the fibroid growth is well known: and to sudden heart failure, pulmonary embolism or to apoplexy may no doubt be attributed many a postoperative death occurring at the beginning of an apparently normal convalescence." In a record of eighteen hundred laparotomies that Mallett examined, "death occurred in six cases from embolism. . . . In three of the six cases the operation was performed for fibroma of the uterus." The three cases died, respectively, twenty-eight hours, forty-eight hours and four days after the operation. In all the cases death occurred suddenly.

Investigation, according to Shoemaker, has shown that the heart muscle in the presence of fibroid tumor is liable to a special form of degeneration, and in this opinion he follows closely what was asserted by the German surgeons years ago. And so, although in fibroid disease embolism and cardiac degeneration have been recognized, and sudden deaths from these causes have occurred (although only too infrequently reported), we are almost universally told by surgeons that operations for fibroid tumors are comparatively safe. In this connection I have recently gone over the books of the Gynecean Hospital from the opening of the institution eighteen years ago and find there have been nineteen patients to whom sudden attacks as of a stroke of lightning have come, all but two of whom have died. These cases occurred in the work of four different surgeons—Drs. Baldy, Penrose, Erck, and Beyea. The attacks with two exceptions have occurred after operation and at a time when the patients were considered convalescent and wholly safe. One case died before operation; the second one four hours afterward. The other seventeen cases occurred as follows:

One on the second day—lived 12 hours.

Two on the third day—one lived 12 hours; one recovered.

Three on the fourth day—one lived 2 hours; one 12 hours; one 48 hours.

Two on the fifth day—one lived 2 hours; one 48 hours.

Two on the sixth day—one lived 15 minutes; one 48 hours.

Four on the twelfth day—one recovered; one immediate death; two lived fifteen minutes.

One on the eighteenth day—lived 3 days.

One on the thirtieth day—immediate death.

One on the thirty-fifth day—lived 2 hours.

These attacks occurred without warning or apparent cause in any case—one patient was stricken while laughing and joking with other patients and was dead almost as soon as a nurse could reach her; another patient was aroused suddenly in the night from a sound sleep, sat up in bed, gasped and dropped over dead. I had another patient from the Polyclinic Hospital who had been home for two weeks and while talking and laughing with friends sat down on the bed, fell over and died before help could be summoned.

Diagnosis was made in

Thirteen cases of cardiac,

Four cases of pulmonary,

Two cases of cerebral apoplexy.

In one of the heart cases the attack lasted only twenty-four hours, the patient recovering; one of the lung cases lasted for weeks, slowly recovering.

During the period considered, there were admitted (for operation) to the house 3,413 patients. There were in all 366 cases of fibroid disease. Thirteen of the sudden attacks occurred amongst the fibroid class or 3.55 per cent. of the total. Six sudden deaths only occurred amongst the 3,047 remaining promiscuous class or 2-10 of 1 per cent.

The enormous difference here is startling and most suggestive.

Of late years it has been the habit of those connected with this hospital to operate upon all cases of fibroid tumors admitted; in years past only far advanced and complicated ones were selected. Consequently these cases include both early and easy cases, as well as those of long standing and complicated. It is, therefore, from every standpoint a fair test group, both from the number of different operations and the character of cases considered. The proportion of these attacks in this fibroid group is exceedingly significant and the lesson taught of the dangers of the disease both early and late cannot be ignored. This experience is borne out in my other hospital work and Dr. Erck tells me his is the same—having

had two such deaths during the past year at the Frederick Douglas Hospital; one occurring fifteen days after operation, the second one twenty-eight days afterward.

The different theories advanced by different writers as to the cause of these accidents may or may not be true (Maurice Richardson, for instance, believes them all to be due to embolism of the pulmonary artery), the fact remains; keep a patient in bed as long before an operation as possible, administer any and every treatment conceivable, pick the cases early or late, the accident will occur in spite of all at the most unexpected times and without the slightest preliminary warning. We are helpless to anticipate or prevent it.

I have long ago, with others, held that fibroid disease of the uterus is not a local disease alone, but that the process is practically a general one in that it involves in one way or another organs, how many and to what extent and how early we are unable to tell.

To me this belief has always been the strongest reason for my preferring to operate on fibroid tumors of the uterus as early as I see them. Many of the degenerations are merely efforts of nature to remove the local growth and have not influenced me to a great degree.

Richardson in his excellent paper "On Certain Unavoidable Calamities Following Surgical Operations" has called attention to and explained the great danger of loss of blood in causing these accidents. In fibroid tumors, large and small, this is the one symptom almost always dominant, and the one, as a rule, looked on with great complacency unless it becomes acutely severe. The teaching from certain quarters has been and still is "control the bleeding and ignore the large tumor as long as there are no more serious symptoms." In my opinion this is *the* most serious symptom which accompanies this disease, and should always demand control by removal of the growths at once.

After all is said and done, however, most of us have arrived from one cause or another at the same point—*remove these tumors when you first see them.* But personally I do not deceive myself with the belief that I can do so with a 1 per cent. mortality or anything like it. The earlier we can get these cases, however, the better will we be able to cut down the percentage of sudden deaths. The degenerations which are at the bottom of these results, be they in the blood, in the vessels, in the lungs, the heart or elsewhere, must have a beginning, and there must be a point early in

the inception of the disease when their influence is at a minimum. The earlier we operate the nearer we come to this point of safety. As a practical man, then, looking to the future as well as to the present interest of the patient, I believe that all fibroid tumors of the uterus should be removed when first seen, most especially the small and early ones.

1722 CHESTNUT STREET.

VIARDEL'S TREATISE ON OBSTETRICS.

BY
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With Five Illustrations.

VIARDEL'S work on obstetrics, "Observations sur la pratique des accouchements naturels, contre nature et monstrueux," with five illustrations, is practically known only to those who have given up their leisure time to the study of the history of medicine. The following rambling remarks may be of interest to those engaged in this specialty, because this book exercised considerable influence over the science at the time of its appearance. Although absolutely forgotten at the present time, it long enjoyed a considerable reputation.

Viardel takes the title of Surgeon to the Queen, but not that of Maitre-Chirurgien juré, for the simple reason that he did not obtain the mastership, which alone gave access to Saint-Côme. He served for a long time in the army before establishing himself at Paris. The influence of Félix, the father, First Surgeon to the King, who recognized Viardel's skill, had obtained for him the title of Ordinary Surgeon to the Queen. This post, as we shall see, was extremely useful, because it is well known with what rigor the members of Saint-Côme followed up the illegal practice of surgery, and those familiar with royal privileges may well ask how Viardel could not only practice his profession, but also keep open office. This is explained by consulting his book, which shows that he had an office in the rue de la Vannerie, near the Place de Grève and later in rue Saint-Jacques.

It may be of interest to enumerate some facts relative to the immunities and privileges of the Royal Surgeons. The honors that Saint-Côme gave to the First Surgeon were nearly all fash-

ioned after those rendered by the medical schools to the First Physician to the King. They took precedence in public ceremonies and possessed the right to be the first to partake of communion in those churches frequented by the doctor regents. Their title of Councillor to the King exempted them from a number of legal complications. No matter from what faculty they had received their degrees, they had the right to practice freely in Paris. When they condescended to attend the Faculty of Medicine, dressed in the famous satin gown, the doctor regents went to receive them in great pomp at the bottom of the stairs. And lastly, the First Physician to the King had the right of general surveillance over the practice of medicine in the entire kingdom.

It was about the same with the First Surgeon to the King, at least after the abolition of the position of First Barber, which was bought by Félix and was ever afterwards united with the position that he formerly held. The First Surgeon to the King was consequently a very important person, and it was he who was the ordinary protector of Saint-Côme. His rights were, however, chiefly of an honorary nature, since the corporation of surgeons of the long gown had always preserved its independence, of which it was extremely jealous. Its real chief had always been the Prévôt.

During the reign of Louis XIV., the titularies were Félix, the father, called Félix de Tassy, who occupied the position for twenty-seven years, from 1655 to 1682; Félix, his son, who operated upon his monarch for the famous fistula, and lastly Maréchal, his son-in-law. Beside the First Surgeon, there were the ordinary surgeons, and the quarterly surgeons, whose number was quite considerable. The Queen also had her private surgeons, who enjoyed the same privileges as those of the King, and lastly there were the surgeons of the King's brother.

Roberdeau was the syndic of the Royal Surgeons, all of whom were possessed of the right to practice their profession in Paris without paying the tax of Saint-Côme; but Roberdeau, quite as modest as he was talented, waived this privilege and voluntarily underwent all the examinations for the mastership like any ordinary aspirant. Félix, the son, wished to do the same, and this example was imitated by the majority of Royal Surgeons, except by Viardel, who probably thought himself too old to follow their example. Concerning this he says: "The mastership is an excellent stimulus for young practitioners, in whom it keeps alive zeal for work, but its lack does not prove that he who does not possess

it is of no value, for it is not the robe and the cap which make the doctor." He consequently contented himself with the rights he already possessed, which allowed him to place the coat of arms of the Queen over the door of his office.

Viardel was quite advanced in years when he published his book. His friends, and he seems to have had many, composed in his honor verses and sonnets, which are published in the first part of his book. He was above all an excellent practitioner, and his mind does not appear to be greatly fatigued as the result of reflection on the theory of his art, principally relative to the physiology and anatomy bearing upon it. He remained entirely within the domain of what the ancients had said in this connection. For that matter, his example had been imitated by the majority of obstetricians of his time and one must recollect that the Galenic translation held sway much longer and was much more tenacious than one might suppose a priori. The treatise is dedicated to Félix, the father, First Surgeon to the King and efficacious protector of the corporation of Saint-Côme, and to this dedication of a general nature our author could also add others having a domestic interest. It would appear that he owed him much, as the following quotation will show: "I thank you for the marks of goodness that you have shown me, interesting yourself on occasions which were of extreme importance to me." After this Viardel makes allusion to the pension that Félix had obtained for his son, in the following terms: "To you, Monsieur, I address this treatise as to our common protector; to you, I say, who fills amid universal approbation this illustrious position beside the person of the greatest king in the world, in which rôle none of those who have preceded you have equaled you; and those who shall succeed you will look for no other glory than to continue your work. In your son alone will one find some day a successor worthy to fulfil this noble charge." These somewhat hyperbolic compliments nevertheless testify to his gratitude and to the pride that the members of Saint-Côme, pursued without pity by the then omnipotent faculty, felt in the First Surgeon to the King, who knew how to lighten the troubles with which they were afflicted.

Our author points out the feelings of the surgeons in the following sentence: "Some may, perhaps, be astonished that I have undertaken this work at a time when surgery seems to be hard up, and I myself in danger and in evident peril of being wrecked in the gulf of persecution, considering the tempest which has been raised against me and all my associates." Viardel

admits that he was not involved in any of these difficulties, excepting for his love of surgery, because he was not master surgeon of Saint-Côme: "It is not that I wish to decry in the least the advantages of the mastership; on the contrary, I believe that it is a very good thing to push the young surgeons to the study of good authors, and to induce them to exert themselves in practice in order to be able to acquire this degree." But he then goes on to say: "It is not the cap which makes the doctor, and it does not follow that one is less skillful if one has not passed through all these ceremonies."

And now for an outline of the book, translated from the author's text: "In the first book I speak of labor and the precise time of this, of conception, of the formation of the fetus, of generation of twins, of superfetation, of monsters, of mole with the true signs and indications of pregnancy. In the second book I include several observations that I have made on all kinds of labor, both normal and pathologic, as well as monstrous, with an easy method of performing all sorts of labors without recourse to crotchets, or instruments other than the hand alone. And lastly, in the third book, I speak of the principal diseases which ordinarily occur in women and girls."

I have thought well to quote his chapter on the formation of the fetus as a proof of the influence still exercised at this time by the ancients. In order to be convinced of this, one has only to consult the works of Guillemeau and Viardel.

Viardel speaks of the formation of the membranes from the grossest portion of the semen, etc. The origin of the fetus is due to the formative virtue which is certain, according to Hippocrates, in all the parts of the semen. The development of the embryo is given exactly according to the words of Galen. This is a very characteristic indication of the persistency of the Galenic ideas in many distinguished minds of this time, even of the surgeons, who, by tendency and by calculation, consider themselves much more as innovators than physicians. I give a literal translation of the first chapter of his book, relative to the formation of the fetus.

"There is no one so little versed and clear-sighted in natural affairs as not to know that the two principal materials of generation in perfect animals are the semen and the maternal blood, both of which are destined by their nature to accomplish by the propagation of the species that which they cannot by the preservation of mortal and perishable individuals.

"But it would be in vain that it should desire to be eternal by

means of its principles if it had not found the means to reduce them in power of act, and to accomplish the end for which it has destined them, a thing which could not happen without a propitious spot capable to conceive them, which is nothing else than the womb, this fertile field of human nature, in which the semen having been thrown as in a fruitful earth, it contracts and embraces it in every portion so tightly that one might with difficulty introduce the end of a sound into the internal os, if one is to believe what the divine Hippocrates has left us in writing. The semen being then thrown into and retained within the womb, which is what we call conception properly speaking, wise Nature, who is never lazy, commences at the same time to give rise to this virtue contained and enclosed in this organ, like fire under the cinders, and making the separation of heterogeneous parts encloses the most spiritual portion as if in the center, so that it may equally and more easily communicate its power to all the parts of the circumference, and being animated by the formative virtue, it may commence to trace the first lines of all the parts of the fetus. Consequently the grossest portion of the semen in the separation and agitation of its various component parts, being pushed as far as the circumference and dried by the heat which emanates, and forming a crust similar to that of bread acquired by the heat of an oven, forms the membranes that Nature has destined to serve as an envelope and bed for the little child; I mean to say the placenta, which encloses this spirit within it, for fear, as Aristotle says, in the second book of the Origin of Animals, Chapter IV, that it should escape and separate the delicate fetus from the womb earlier or later according to the nobleness; it is thus that Nature forms the different parts of the fetus one after the other, as takes place in works of art; it acts without doubt in a more excellent and noble way, because the formative virtue being contained in all the parts of the semen (according to the idea of Hippocrates) forms at the same time the essential foundation of all the parts, both internal and external, although several are not in the first place apparent, on account of their minute size, and only become visible successively, because Nature acting equally on all, may nevertheless acquire early or late their perfection, according to their nobility and the necessity of their operations, a fact which incited Galen to divide the entire work of conformation, according to the idea of Hippocrates, into four different stages.

"The first stage is that where the semen is conceived in the womb, and properly speaking is called geniture: this stage is

ordinarily limited to the lapse of seven days, during which Galen believes that the membranes of the placenta are formed, which in man are two in number, namely the chorion, which is the first adherent to the womb by the ends of the vessels, and with which shortly after conception other vessels, both veins and arteries, become anastomosed, which, being dispersed between the folds of this membrane, finally become united in the three trunks, joined together with the urachus to form the umbilical vessels; the other membrane, which composes the placenta, is called the amnios, which immediately envelops the fetus completely, serving as a receptacle for the sweat and urine that the fetus gives off, during the entire time that he remains within the womb, according to Galen, X. de Semine, Chapter VII., to which membranes, if one adds the placenta to the uterine liver, which is nothing else than a porous and spongy flesh made to uphold the ramifications of the vessels of the womb, and to give, according to certain authors, a preparation to the blood, we have what one calls the placenta or the envelope of the child.

"The second stage of the formation of the fetus is when, after the first outlines of the solid parts, the kind of semen disappears little by little, by effusion of the blood which is carried there insensibly, the kind or rather the figure of the semen, and shows itself in the form of a reddish mass of flesh, what one usually calls ναμχα or conception; this stage, according to Avicenne, lasts for the space of nine days, during which time one commences to distinctly see the three principal parts which previously were represented by three little bottles, namly the brain, the heart, the liver."

"The third stage is when the three noble parts, being entirely formed and achieved, Nature commences the formation of all the others, although obscurely represented, which we ordinarily call the embryo, which stage ordinarily lasts for twelve days.

"Lastly, the final stage of all in the formation of the fetus lasts for forty days, during which all the parts are organized, and lasts about eighteen days, during which all the parts receive their final perfection."

In the study of the symptoms of pregnancy, Viardel has also retained those indicated by Hippocrates; for example, the sensations felt by the woman during a fecundating coitus, the facial expression and mental perturbation, the excessive contraction of the internal os of the uterus. He cannot, however, resist remark-

ing, as did Mauriceau, that this hermetic closure must be inconstant, for the simple reason that superfetation can occur.

The indications that may be drawn from the suppression of menstruation, he considers as follows: "The third mark of conception, according to Galen, is when the menstrual purgations become arrested without any cause or preceding disease, because Nature holds back the blood for the formation of the fetus in the womb."

One may also be suspicious of pregnancy: "If the breasts swell and become hard on account of the reflux of blood which takes place in the womb in its veins, for the formation of milk. And lastly, if there occur, as there do ordinarily, during the first months of pregnancy, disgust of food, vomiting, and nausea." The following relates to the movements of the fetus in utero. The fetus, he says, does not move at the beginning of pregnancy, because its constituent parts are too weak or too soft and "it is necessary that the parts of the body and the organs which must move them be not only formed, but they must be hard and dry in order not to break, and so forth . . . when the bones and the nerves have commenced to harden and the membranes and ligaments to dry, then it commences to move, namely, male children at three months, according to Hippocrates, and female children at four months."

With so few symptoms, usually of such tardy appearance and so little marked, it is not at all extraordinary that many errors were committed in making a diagnosis of pregnancy. The following case, related by Viardel, of a young woman who perhaps had an interest in concealing her pregnancy, and who, on the other hand, had never felt the movements of the child, is interesting, because it shows the difficulty in which obstetricians of that period found themselves in a type of case so easily diagnosticated at the present time. "I was called to see a young woman who had recently come from the country, . . . and having talked with her, the first thing that she told me was that the physicians of the place whence she came had given her up and she begged me with insistency to give her some remedies to empty the waters and also begged me to put promptly into execution any treatment that might relieve her, all the more so on account of the fact that she could not remain any length of time in Paris on account of an important lawsuit which would oblige her to return to her home, assuring me that I would receive all imaginable satisfaction. After having declared to me all her ideas, and after I had interrogated her several times as to the condition of her

disease, I palpated the abdomen with the palm of my four fingers, but principally in the region of the womb, where I perceived a movement which is not met with in hydropsy. It is to be remarked that this young woman did not believe herself pregnant, because she had felt no movement of the child in the womb, and knowing this and seeing that the patient was obstinate in believing herself hydropic, I persuaded her to take the advice of a physician of this town, who would be more knowing than the physicians of her country; this she did, and there was even a consultation and we concluded that she was pregnant, and we ordered some purgative like manna, rhubarb and other remedies to strengthen her, with soft and mild injections, while awaiting the hour of her labor, which arrived at the natural term, and I delivered her happily of a fine boy, who is still living.

"I do not know whether this young woman had any bad intention, but this should be a slight warning to many midwives and surgeons, who might be blinded by the passion of gain under such circumstances and perhaps do things which would not be exactly the duty of a Christian."

Viardel had certainly the merit of ridiculing the possibility of pregnancies of eleven to twelve months, which de la Motte later on erroneously considered as exact. Like Hippocrates, he admitted that ten months constituted the extreme term of pregnancy "beyond which all children which are born after the death of their father, should not be considered legitimate." He then says that if Arisotle speaks of eleven month pregnancies, "one should not understand by this the eleventh complete month, but only the commencement of the eleventh."

Viardel held to the traditional ideas, "In those things which relate to the situation of the fetus in the womb, I say that, according to Hippocrates, the child is placed in the womb in such a way that, being curled up in a lump, his heels are near the buttocks, both hands on the knees, between which he lowers his head." He was supposed to remain in this position as long as his food was sufficient.

According to Viardel, the fetus plays an active part in expulsion, "as soon as the food begins to lack, turning the head downwards towards the internal os of the womb, he endeavors to escape, a thing which is all the easier because before turning a somersault he ruptures the membranes by kicking them with his feet." We will, however, show how he was an expert in his art and where he considered tradition less and offered personal remarks. One of the

best proofs of Viardel's merit is what he said regarding the treatment of pregnant syphilitic women. The employment of mercury often applied without reason and pushed to an extreme, generally until salivation was produced, had caused this efficient remedy to fall in the esteem of the public and among physicians as well. Bienaise had even written a thesis in Habicot's time to show



Fig. 1. Position of the Child (Viardel).

that syphilis should still be treated with mercury. Obstetricians were extremely fearful that this powerful, but dangerous, remedy might produce miscarriage, and the greater number, including Peu, condemned its use during gestation. Viardel was not of this opinion, and the following quotation is very interesting as far as the history of medicine is concerned:

"As there are many surgeons who make considerable fuss about treating syphilitic pregnant women, I thought that it would not be inappropriate to add here not only my opinion in this present chapter, but to enlighten those who apprehend undertaking the cure of this disease under these conditions, which is frequently met with in the time in which we live, because in the year sixteen hundred and sixty-four, on the fourth of April, a woman whom I knew sent to me a girl of twenty-five years of age, who was four months pregnant, to be treated for syphilis. Having examined her as exactly as was possible, I found that she had several chancres and numerous crusts on the lips of the external orifice of the womb, with clap, accompanied by nocturnal pains in the head, arms, and legs. This was sufficient for me to know that she had the pox, and, for that matter, she had enjoyed life sufficiently to have contracted it. After I had examined her, and having explained to her the nature of her disease, I excused myself civilly to her, saying that my employ did not allow me to treat her, because I was employed in the practice of obstetrics and not in treating such diseases, but perceiving that she had such great confidence in me, I promised her that I would place her in the hands of a surgeon of my acquaintance, very competent in this practice, who would treat her very well, and that I would deliver her when she was at term, and she having accepted my offer, I conducted her to my friend, M. Vitalis, where she remained for six entire weeks, and after having been well prepared by baths, she was given the mouth flux during a month, after which time she entirely recovered a perfect health without being in the slightest incommoded, up to the time that I delivered her happily at term of a fine, fat girl, who is still living, her mother being better than she ever was. From which it is easy to conclude that, if one had waited to treat this woman after labor, it is evident that her child would have been completely infected with this pernicious virus, which once having spoilt and lost the mass of blood, would have completely ruptured all the parts in their formation.

"By means of the good treatment that was given her, the mass of blood was perfectly purified and returned to its former condition, a fact which did not a little contribute to the formation of the child and its health, which would have been notably involved if the maternal blood (which is one of the principles of our generation), had been infected; I do not conclude that for this reason one should expose pregnant women to the bath, this practice would be extremely dangerous; but to know the occasions in which

one may undertake it it is necessary to be guided by the prudent judgment of some skillful physician."

While reviewing the subject of pregnancy, I will transcribe a very interesting case of prolapse of the pregnant uterus in which Viardel gives the indications of the conduct to be followed in order to avoid complications.

"The wife of M. Bonin, a master embroiderer, pregnant with her first child May 22d, 1668, had at the middle of pregnancy a relaxation of the womb which fell into the vagina, the size of an egg; this descent incommoded her to such an extent that she could not walk, which was the reason that her mother summoned me in order to give her some relief. The first thing that I did after having examined her was to place her in position; after which I reduced the womb and placed it promptly in its natural position, introducing a vaginal pessary to prevent it from coming down again. All this happened exactly as I intended, because she had no more trouble up to the time that she should be delivered; because when approaching her term and the pessary having been removed, the relaxation returned, the womb being much pressed by the weight of the child, which obliged her to expel it. The term of labor having arrived and the pains being pressing, I was sent for to deliver her. Having arrived, I found that there were two operations to perform, namely, the delivery and the reduction of the womb, which had again become relaxed. On account of this contraindication, which opposed itself to my designs, I did not leave her the entire day that she was in labor; and the waters having broken, I managed in such a way, that as the pains pushed downward, I pushed the womb upwards with the end of my fingers towards the external orifice until the head of the child was at the vulva, which I received shortly afterwards most happily; the afterbirth was delivered accompanied by a second falling of the womb, produced by the great efforts which had preceded, but I put it back into its position, using the same method that I will enlarge upon in the chapter on relaxation."

What Viardel has to say on natural labor is very short and expressed in about the same terms as are found in Guillemeau's work. For this reason I consider it useless to say much, but I shall, however, translate two passages which relate, respectively, to vaginal examination during labor and to the manner of delivering, and, if necessary, of avoiding such accidents as retention of the placenta.

In the first of these paragraphs Viardel rightly insists on the

necessity of vaginal examination, on the way to carry it out and on the very precious information that this physical exploration gives relative to the progress of labor and the nature of the presentation, but he energetically advises against a vaginal examination being made with the woman in the upright position, which, as he says, exposes her to a premature rupture of the membranes, which, with a few exceptions, should never be allowed. In order to exactly understand this passage, it should be recalled that the majority of midwives were accustomed, in order to hasten labor, to have the patients walk for a long time. On the other hand many pregnant women declared that they were unable to remain in bed and were desirous of lying on a lounge during the entire period of expulsion.

In the passage in which he speaks of delivery, Viardel makes a most extraordinary mixture of absurd things that he had heard of being done by midwives and excellent ideas that he had derived from his personal experience. He commences by showing the numerous complications which occasionally accompany a bad delivery, and he says that in general the placenta falls without difficulty like ripe fruit, but that, unfortunately, it is not always thus. Before arriving at the ultimate argument, our author believes it his duty to give different recipes which were currently employed by the midwives of his time. The patient was in the first place forced to sneeze and, if necessary, certain irritating powders were introduced into the nostrils to produce this effect, and, if these were not successful, the cord was tied around one of the patient's thighs in order to prevent this organ from retracting into the interior of the uterus. Philippe Peu has certainly the merit of demonstrating the uselessness of such practice, as well as the considerable danger to which it may expose the woman, such as severe hemorrhage. In case of adherent placenta, the patient was given a decoction of mugwort or motherwort, but they considered the most potent remedy to be a drachm of pulverized calcined placenta of another woman mixed in a glass of white wine.

Concerning vaginal examination and the means of delivering the placenta after the child has been expelled, Viardel says: "My design being to give to the public those observations which I have been able to make in the practice of obstetrics, upon which entirely depends the first step which should be taken, which is to make a vaginal examination of pregnant women in the proper way, in order to easily recognize if all things which should unite

to render a labor fortunate, are met with or not, I thought I could not do better than by, in the first place, describing the method of vaginal examination which should be employed, in women about to be delivered, before getting oneself ready to deliver them, a thing which is very important to be understood by surgeon obstetricians and midwives, who give themselves up to such practice, since all the rest depends on this commencement, and the good or bad post-partum ordinarily depends on the first means that have been applied from the vaginal examination, since from this we should draw our indications of the labor and the various presentations

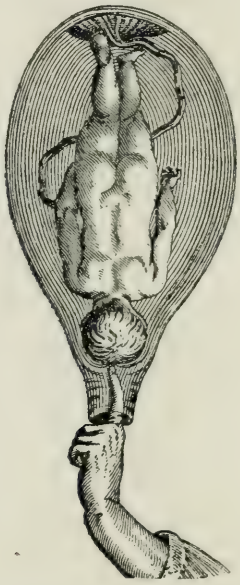


Fig. 2. Digital Examination (Viardel).

of the child, according to the order of Nature, or when it arrives contra naturam.

"Now, in order to judge perfectly, it is necessary to place the patient in a proper position, as is required and necessary in all operations, and then afterwards the surgeon or the midwife will take that which is the most proper in order to operate easily; the woman should consequently be placed on the back, the buttocks somewhat raised and the legs placed so that the heels will be as near the buttocks as possible, and after having spread the thighs apart, one or two fingers covered with butter or other oily substance

should be introduced into the neck of the womb, under a cover, carrying them gently as far up as possible, in order to judge the size of the dilatation of the internal orifice of the womb, to discover whether the labor will be prompt or tardy; and afterwards one will draw the indications of all that one has felt, and if some bad presentation of the child is discovered, a prognosis will be made in order to judge of what will be necessary to do, because the indications will vary according to whether the child is well placed or abnormally situated. It is not that one cannot make a vaginal examination with the woman standing, or seated, either

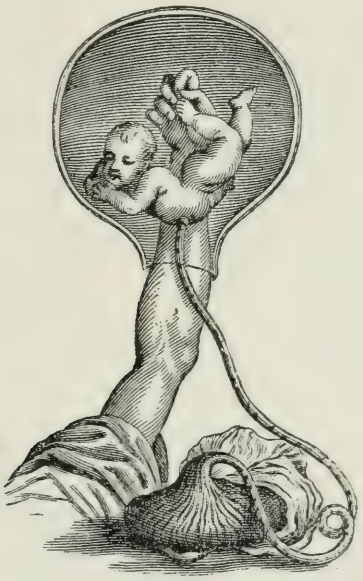


Fig. 3. Podalic Version (Viardel).

on a chair without being in the position mentioned above, but it is to be feared that the surgeon or the midwife introducing the hand at the time when the pain occurs, the membranes bulging and ready to break if only slightly touched, the waters will come through and the child immediately escape, and often fall to the ground, as I have several times seen; this is why I think that it is better to have the patient on the bed in the position already mentioned, all the more so that the neck of the womb opens and dilates better in this posture than in any other.

"The waters then having come away, one should wait for the

fruit to fall of itself, being in perfect maturity, without precipitating anything, although four or five days may have elapsed since the commencement of labor as it frequently happens, unless some accident should arise, such as convulsions or a free loss of blood.

"All concerning that which I present as pathologic, should be governed by the prudence of the surgeon and others versed in this practice to perform his duty and not to defer the extraction of the child.

"As I have done, and as I shall point out in the following chapter, without waiting for the strength of the mother to entirely

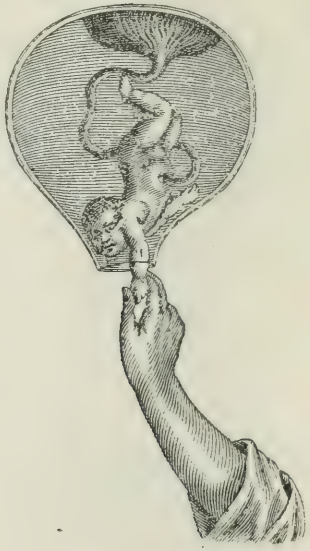


Fig. 4. Arm Presentation (Viardel).

disappear, do all that can be done, draw the child by the feet if there are pains, or if there are none, provided that there is a sufficient opening one should find no difficulty; and the earlier this is done, the better, both for the mother and child; for the mother so that she will soon be delivered from the pains from which she suffers, and for the child so as to be able to give him, as soon as possible, the sacrament of baptism in cases of extreme danger and by this means to give him, at the same time, the life of body and soul, observing that if the child is in danger of death or that the labor is perilous, one may sprinkle the first part which presents, whether it be the foot or the hand.

"I would here warn that one should not be too hasty in this operation, and should never employ certain of those who interfere, who are so precipitate in all that they do, that they are no sooner in the room than they wish at once to expedite their operations and return home as quickly as they have come, a condition which very frequently is against the interest, and much to the detriment of the mother and child, which they withdraw in pieces or intact, irritating the womb so much by the violence that they employ that they inflame it so that occasionally gangrene will arise."

We now come to the section treating the means of removing the placenta and those necessary when it is adherent.

"Nature, who is very wise and foreseeing, has not showed herself less careful for the preservation of animals than for other beings, because in the same way that she preserves the greater number of fruits in their first production, enclosing some in shells, others in pods until their perfect maturity, to defend and preserve them from injuries by the weather, thus having no less care of animals and principally of man, she is not only content to have enclosed him during his first formation in the womb, as in a retreat assured for preserving him from external injuries, but she has also wished to build for him a home or particular envelope, composed of two membranes and of a mass of flesh that is called ordinarily in Latin sæcondinæ, patere que secundo a fœtu in lucem editur, which naturally should never come out of the womb after the child, just as we believe that the pods and envelopes of fruits remain for a certain time attached to the tree after the fruit has fallen to the ground from its perfect maturity, and it is also for this reason that the French have called it the arrière-faix, because it is the last burden that the womb becomes delivered of after labor, which, being retained too long within it, is without doubt a useless burden, as well as pathologic, which only incommodes and which we should be careful to deliver as soon as possible, if we are desirous of avoiding a number of accidents which are accustomed to follow the retention of the placenta in the womb, such as loss of blood, convulsion, syncope and other similar ones.

"For this reason, in order to avoid such accidents and to act when they do occur, I have found it timely to add here in what way one should act in order to deliver a woman after labor, and principally if the umbilical vessels having broken, the placenta is retained in the womb and very adherent to the fundus, a condition which very frequently gives trouble to midwives, especially

when it must be sought for without the ordinary guide, which is the umbilical vessels, and since they are not usually the most expert in the knowledge of anatomy, from fear of mistaking the substance of the womb for the placenta itself, they have recourse to the aid of some expert surgeon obstetrician, who will take hold of matters.

"In the first place the patient is placed across the bed as in all complicated labors, and with the greatest prudence and considering that since Nature has not expelled it after the child, it must be that it is adherent at some part of the womb, which complication may be remedied in this way, he should hold the umbilical cord between the fingers of the left hand and shake it here and there with the right hand, all the while pulling upon it gently and requesting the patient to bear down with the same strength that she employed while expelling the child, making her blow into her hands or even producing sneezing with certain powders that he blows into the nose with a goose quill, so that these kinds of concussive movements push the diaphragm and other parts of the lower abdomen downwards, and can compress the womb and oblige it to get rid of this foreign body contained within it. I refer to the placenta, without forgetting to soften and lubricate the womb occasionally by the use of butter that should be from time to time introduced within it.

"This is the manner that I employ for removing the placenta, without any violence, and as I have often practised it.

"But if, after having done all that I have said, the afterbirth remains retained within the womb, it is necessary then to ligate the umbilicus of the child in the manner that I have already given, to cut the cord between two ligatures, to give the child to the nurse so that it may be placed near the fire, and to do all that may be necessary. After which the other end of the cord should be tied to the mother's thigh, while a strong and carminative enema is prepared for her, to which are added a few drops of yellow amber oil, and of which she should take four or five drops in a glass of white wine, or in a decoction of mugwort or motherwort. Castoreum is also a very good remedy to attain this end, as it can also be given in a glass of white wine containing a dram of the afterbirth of another woman, which has been calcined and reduced to powder.

"It occasionally happens that by the use of the above-mentioned remedies, the placenta becomes detached, but it will not come out, so that the method must be changed, and after having detached

the cord from the woman's thigh, one should hold it with the left hand as a guide to the right hand which is introduced to the fundus of the womb, where the placenta is attached and going around this with the ends of the fingers, push it from side to side and place the fingers between the walls of the womb and placenta, in order to detach it from the point at which it adheres, care being taken not to excoriate or wound the womb, and to accomplish this the finger nails must be cut as short as is possible, in order to avoid such unfortunate mishaps.

"But, if by mishap it should occur that the cord breaks by pulling on it too much, then the surgeon or the midwife, having lost his guide and being well versed in anatomy, so as to differentiate between the placenta and the womb, will carry his hand upwards in order to endeavor to withdraw the former.

"But, if the placenta is so adherent to the womb, that by the means of all these remedies and this way of operating, it cannot be extracted, one is free to either draw it out with the hand, as we have already said, intact, or divided in pieces, taking care to avoid wounding the womb, or else to entirely give over the care to Nature, aiding her, nevertheless, by the use of good injections that should be thrown up into the womb, in the way that we have already indicated in Chapter XXVII., as well as with good cordial remedies to fortify the mother and to resist the malignant vapors, because should a small bit of the placenta remain behind, it will cause the same accidents as if the whole of it were retained, and by its own weight it may more easily become detached; and in order not to be blamed by those present, you will make your prognosis for the future mentioning all complications which may happen. . . ."

Viardel then goes on to give those precepts which should be followed for making a good ligature of the cord. One should not forget that the midwives at this time, who were so ignorant in all matters relative to obstetrics, did not even know how to make a ligature of the cord with necessary prudence, and it would appear that some of them at least did not even take the trouble to do it at all. This ligature may perhaps be useless in some cases, but absolutely necessary in others, and I here give in our author's own words the practice to follow:

"Although it may seem that ligation of the cord is not a very considerable operation, and that it is neglected by the larger number of those who mix themselves up in the practice of obstetrics, because one sees it practised by a large quantity of women in

extreme need, who are in no way cognizant of the necessity, nor of the antiquity of this operation, because it was first done by our first parents, long before either medicine or surgery was in vogue among men, at the commencement of the world, this is why I thought it would be not out of the way to here add the manner of doing it before speaking of my own observations.

"I will say consequently, that before undertaking this operation, one should ligate the umbilical vessel, at the distance of two fingers' breadths from the abdomen, with a strong double string, making three turns around the cord, and after having made a knot, one may still make two more turns and then tie again opposite the first knot which has already been made, and cut the cord a good inch and a half in the middle of these two ligatures; and, after having cut it, one should do as I do, placing a small compress, which, when forgotten, frequently causes the death of the mother; I have wished to add this at the end of this chapter without shocking anybody, but only to insist that one cannot take too many of these precautions and act with too great prudence in this operation, as will be seen in the commencement, but to act with wisdom, since life and death, both of the mother and the child, very frequently depends upon our good or bad conduct in the carrying out of this operation."

Besides retention of the placenta, Viardel recognizes as causes of many deaths, unfortunate labors which have produced extensive laceration of the perineum, contusions of the cervix which become gangrenous, and mistakes on the part of the midwives, who are ignorant as to how the placenta should be attended to. He recommends the use of injections, the good effects of some of them being easily explained by the antiseptic properties of some of their components. I have thought it interesting to translate this chapter and add, also, a paragraph relative to abscess of the breast. The want of disinfection, drainage, etc., caused collections of pus in the mammary glands to be far more dangerous, and especially more rebellious than at the present time, and persistent fistulæ were not at all infrequent.

"Like all beautiful fruit, that is seen hanging on the trees, and does not always come to perfect maturity on account of the continual movement which happens to it by external injury, which frequently causes death of the tree and the fruit, likewise a pregnant woman is subject to a large number of accidents, both internal and external, which frequently cause severe disorders to her person and her fruit; to her person, by the cacochymia or

plethora, by the narrowing of the passage in the young, by the dryness of the same parts in the older. From all this many accidents are apt to accrue, such as excoriations of the cervix or the fundus of the womb, because one has wished to pull the placenta with too great violence in order to detach it, sometimes even piecemeal, a practice which should not be undertaken, because it would be much better to let it remain and not to pull upon it with too great violence, as I will point out in a chapter which treats of this matter; because the womb is often irritated and inflamed by the disorders caused by the exit of the child, and sometimes by the violence produced by the hand when it has been introduced by force, a thing that one is often obliged to do in order to prevent accidents which occur, and which causes great inflammation and sometimes gangrene and sphacelus, and afterwards death; which arises from the negligence of young midwives who, after having delivered the woman, do not give orders to the nurses to watch for accidents which happen, and to avert them; and one should use injections into the womb two or three times a day with some proper and specific remedy, which may resist decomposition, that can be recognized by the cadaverous and stinking discharge which occasionally comes on in twenty-four hours; and, supposing that it has already occurred, one may remedy it in this way, beginning with injections which should be made with a decoction of mallows, pellitory, mercurial, motherwort, mugwort, chamomile, and melilot, of each half a manipule, which should be boiled together in three pints of water; and in a pint of the acolature, one should dissolve an ounce of myrrh, one ounce of aloes, two ounces of honey with half a septier of good spirits of wine, and give an injection three times a day into the womb, raising the buttocks of the patient as much as necessary in order to have it retained with greater ease, holding the labia together for a certain time in order to prevent it from escaping.

"But, if gangrene of the cervix of the womb arises, it should be scarified in several different points longitudinally and until the blood flows, then insert several rolls of lint attached to a string, which should be left hanging outside in order to withdraw them with greater ease; a sponge may be used, if one so wishes, soaked in phagedenic water, to which is added some alcohol, or spirits of wine, or one may infuse myrrh, aloes, and aristoloch in alcohol, in which the lint or sponges may be soaked, and with which the neck of the womb should be filled, previously having washed it; one may also use egyptiac with the salt dissolved in alcohol.

"This is the manner by which such accidents may be remedied, to which you may add the employment of cordial remedies, which should be prescribed by the physician, or else, in his absence, you will order a drink made with a handful of barley, dog's-grass, and the root of scorzonera and licorice for the ordinary drink, and, if there is no fever, a little white wine may be given, in order to resist the vapors which rise from the womb, and which facilitate the exit of the discharges, and afterwards you will dissolve half a scruple of confection of hyacinth and alkermes in a glass of the tisane, which she should take evening and morning, on an empty stomach, observing that the drinks and remedies should be tepid when taken for fear that they may give rise to uterine pain."

With the maladroitness of midwives and the inexperience of many obstetricians, lacerations of the perineum were far more frequent than at the present time. As soon as the head had been delivered many surgeons precipitated the labor by forcibly drawing down the arm without waiting for rotation of the shoulders, in order to extract the fetus hurriedly and to show their great skill. One should also remember that both hands were introduced into the vagina in order to direct the head to better advantage during its exit, as they said. Dionis at a later date when he wrote, still recommended this maneuver. Again a badly performed version frequently resulted in severe laceration of the perineum, and Peu mentions a case where the vulva was completely obliterated by extensive cicatrization. More frequently enormous cavities remained, in direct continuity with the vagina and rectum. I append what Viardel has to say on this subject:

"As it is quite a frequent thing during labors to see some contusions and lacerations of the womb, no matter how careful a midwife or a surgeon accoucheur may be to prevent them, and since even, either on account of the narrowness of the passage or other causes, tears and nicks of a considerable extent very frequently occur, principally at the lower portion of the external orifice, in order to entirely end this little treatise on diseases of women I thought it would not be out of place to here give my opinion and the manner of remedying these things.

"*Causes.*—One should consequently remark that the ordinary causes of such accidents are several; these occur naturally either through the narrowness of the passage in women who are too young, or who are too old, or because the child is extremely large.

"Or it happens contra naturam by a vice or bad formation of the

said parts, or when there is a callosity or tumor which prevents dilatation.

"*Diagnosis.*—The way in which the complication has occurred can be easily recognized by considering the above-mentioned causes.

"*Prognosis.*—As far as the prognosis is concerned it is very constant that such contusions and lacerations are often very dangerous on account of the accidents which may follow them, because they are so badly dressed on account of the dampness of this part, which is like a drain for all parts of the body, they may degenerate into ulcers or even produce gangrene by corruption, or if the laceration is large and becomes cicatrized, it may last during the entire life of the woman in the same condition.

"This is why in order to obviate such condition, I say first, that it is necessary to proceed in the same way that I did in the case of a woman in Paris. Namely, that if there are simply some contusions or nicks of slight extent, they may be washed with a decoction of agrimony, barley or roses of Provence, or with ordinary wine, in which roses of Provence and flowers of the pomegranate have been infused or boiled, and if this is not sufficient, one may have recourse to the oil of hypericon or to some particular kind of balsam.

"But if it should unfortunately happen that the split is considerable, that the entire perineum and intergluteal space is ripped, as occurred with this young woman, to whom I alluded above, so that the above-mentioned remedies alone are not of themselves enough to cure the lesions, it is necessary under these circumstances to find out if the laceration or tear is recent or inveterate. Because, if it has been present for some time, the cicatrix should be freshened with the knife, by cutting the skin which has become involved, just as one does a harelip, and after having freshened the borders, they should be allowed to bleed to prevent inflammation and, afterwards, one may make a suture in the middle of the wound and at both ends, using interrupted sutures, tying them above and below; then one applies lint, soaked in some balsam, and the wound is dressed until a perfect cure results. But if the laceration is recent, as in the case of the young woman that I have spoken about, which had existed for only three days, one should wash the wound with an astringent decoction as I did, and make a running suture, beginning near the anal orifice and extending up to the opening which is natural, where the laceration commenced, placing above some dressings, ordering the

patient or the nurse to hold between two fingers the gluteal slit as long as possible, in order to make the wound still more solid, dressing it like ordinary wounds, bleeding the patient, if necessary, to prevent inflammation; and by this means the wound will cicatrize in two weeks as it did in this young woman, where I used no other remedy than one part turpentine and one part honey smeared over it with a bit of linen twice a day.

"Here is the end of what I have to say regarding the principal diseases of women, that I was desirous of adding here for the persuasion of my friends, as clearly and as methodically as it was possible, hoping some day to treat it more in detail, and make it more ample in remarks and cases that I might meet with in my practice, both in obstetrics and in particular diseases and other symptoms that I might observe, trusting that the whole might be for the glory of God and for the salvation of our fellow beings.

"*Diseases of the breasts.*—Diseases of the breasts distinctively spoken of are several in number, but my intention here is only to describe those which ordinarily occur to nursing women. I will reduce them all to three kinds, namely: Inflammation, tumor, and ulcer.

"*Inflammation of the breasts and its causes.*—I commence consequently with inflammation, as it is the most general disease, which can happen to all kinds of women, whether they are pregnant or not. Inflammation of the breasts takes place in two ways, namely, either by too great a quantity of blood, and principally if it is heated, or by a too great abundance of milk, which becomes coagulated in the breasts and often goes on to suppuration.

"*Its differences.*—The first kind of inflammation caused by the blood may arise in girls and widows just as well as in married women. The second is distinctive and is peculiar to pregnant women and those who have been delivered.

"*Diagnostic signs.*—One will recognize that the inflammation is caused by the blood, if the patient is of a sanguineous temperament, which will be noticed by the red color, by the size of the vessels, and by the habit of the body, which is strong and muscular, and especially if the patient has not menstruated, and if she eats much of good food without taking any exercise, or only a little. If the disease comes from the milk, as is usually the case, it will be recognized by the great abundance of the latter.

"*Prognostic signs.*—As it happens, no matter from what cause, the disease is always dangerous, all the more so because it may

produce a scirrhus, cancer or ulcer, which are very difficult to cure, on account of the delicacy of the parts.

"This is why at the same time that one is called the patient should in the first place be bled, and especially from the foot, and after having removed the fullness, if the fever is not very high, the patient should be gently purged, taking advice of a physician if possible; after which one may resort to topical remedies, which should be in the beginning revulsive. But being afraid to force the womb towards the noble parts, one may consequently make use in the beginning of oxicrat or tepid oxyrodus. But, if the inflammation or tumor arises from coagulated milk in the breasts, one should not use revulsives for fear of rendering the matter more compact, which might then degenerate into scirrhus. Afterwards one should use resolutives like oil of chamomile, lily and other similar ones, and if the matter cannot absorb, suppuration should be aided by digestives, poultices or ointments used in other tumors, and the matter having been let out by incision, or otherwise, the ulcer should be modified and cicatrized with modificatives or astringents like roses of Provence in heavy wine with a little alum.

"However, one should be careful that the nursing woman should not give the breast to the little child, the more so as by this means the humors will be drawn more to the diseased part and principally if the pain and inflammation are considerable, otherwise one will allow her to do so, but with great gentleness.

"*Cure of ulcers of the breast.*—As it ordinarily happens that half of the tumors degenerate into ulcer after suppuration, it is necessary after having spoken of inflammation and tumor of the breast to say something of ulcers which follow.

"*The causes.*—I consequently say, in the first place, that ulcer of the breasts more frequently happens after an inflammation or tumor of this organ, or from some contusion from a blow or pressure on the part, or by some fluxion or discharge, or the transportation of some acrid and corrupted humor.

"*Diagnostic signs.*—It is a disease that one may recognize by a simple inspection of the diseased part, and especially if it follows a tumor and inflammation.

"*Prognosis.*—The ulcers which arise in the breasts are extremely difficult to cure, because this part easily receives the excrements, being glandular and weak in its nature. Also on account of its too great humidity, which frequently delays the exsiccation and cicatrization of the ulcers and prevents the cure.

"*The cure of ulcers of the breasts.*—To undertake the cure it is necessary in the first place to cleanse the ulcer with hot red wine and some alterative, and after having preceded the general remedies, but principally purgation, in order to remove the cacochymia, and by this means it will be consolidated and cicatrized. One should take gall nuts and cypress, ten of each kind, roses of Provence and bark of the pomegranate, a half a fistful, with half a manipule of sumach; you cook all in heavy red wine and foment the part, or you may thicken it to the consistency of honey and apply it on the ulcer with lint. Wine plaster and gray ointment with diapompholigos are excellent for cicatrization and bring about complete cure.

"*On fissures which arise in the breasts.*—After having spoken of ulcers of the breasts, it is necessary to add a few words relative to fissures or slits which arise in the nipples. One should know that fissures or chaps arise very frequently in the nipples, as well as in the lips and other parts of the body.

"*Their causes.*—Fissures of the nipples arise, either from an internal cause, or from an external cause; they arise from an internal cause when they are produced by some acrid and caustic serosity. They may also arise from some excoriation or injury. They are recognized by the sight alone. But there is some danger that they may degenerate into ulcer, and it is for this reason that they should be dried and modified with white wine and rose water and afterwards lead ointment or fresh butter should be used; or with an ointment composed of oil of sweet almonds, wax, mucilage of the seed of psyllum and quince."

After this Viardel draws attention to a complication which occasionally occurs after labor, namely, inversion of the uterus. Although all the treatises on obstetrics of this kind warn midwives not to pull blindly on the cord, these precepts were far from being always observed, and I here give Viardel's recommendations as to how to act when this complication arises.

"Having now to speak of relaxation and prolapse of the womb, I have thought, in order to avoid confusion and to establish order, which is the soul and the torch of all sciences, that it was necessary, in order not to confound the morbid movement with the natural, to say, in the first place, something of the womb and its movements.

"It is for this reason that one should know that by womb we understand that part of the female body which by Nature is destined to receive the semen, to foment it and to reduce its power

to act, that is to say, to place it in such a manner in all the parts that it can form another animal. And it is for this subject that the greater number of philosophers have spoken of it in quite a particular way, because Pliny says that the womb is like a fertile field of human nature, and not without reason, because, like all seeds of plants and trees remaining sterile and without producing anything, if they were not in the first place received into the earth to germinate there, which is like the universal womb of all nature. Consequently, the seed of animals, although fertile and well disposed, if it is not received into the womb, remains deprived of its action, which is nothing else than generation. And it is without doubt this reason that makes the womb desire it and become agitated with various movements, because it comes forward in order to receive the semen if necessary, and if it sees that it is destitute of it, it sometimes mounts upwards, and, by this variety of movement, produces numerous symptoms, which caused Plato to say that it was like an animal enclosed in another animal. But being desirous of considering this matter more in detail later on, when speaking of pale color and other symptoms which frequently arise in women and girls, I will content myself, for the present, with speaking of the prolapse of this organ and the means to remedy it.

"This is why, if a surgeon happens to be called to remedy such an accident, he should treat it in this way: He will first place the patient on her back across the bed, having the buttocks a little higher than the rest of the body and the thighs spread apart as in labor and, having placed the patient in this position, he will bring three fingers together and push the womb with a cloth dipped in tepid red wine, joining his fingers together in the form of a pessary, telling the patient to hold her breath while he should do everything in his power to push the womb into its natural position and to retain it in this state by the use of some pessary if the prolapse does not occur after a labor, as you will see by the following case.

"But, if the prolapse arises from a labor, it should be remedied in the way that I did to this woman, who gave birth to two children of whom I have spoken above, namely, by placing a piece of linen over the entire prolapse and joining the five fingers together in the form of a pessary, it is to be pushed into its natural position, having the woman hold her breath and having, in the first place, placed her in a proper position . . . leaving the woman in this situation for a certain time, without, however, constraining

her and allowing her only to extend the legs, and making her abstain from speaking as much as possible, from coughing or sneezing, and other similar concussive movements, because, by these, the diaphragm being pushed downwards, compresses all the parts of the lower abdomen, and, by this means, a second prolapse of the uterus may occur; this is why, in order to avoid such an accident, a piece of linen rolled up should be inserted and pushed as far upwards as possible toward the internal orifice of the womb, as much for preventing the prolapse from recurring as to receive the lochia, allowing it to hang outside in order to withdraw it, as is necessary.

"This does not mean that one cannot use a hollow cork pessary if one wishes, which is covered with wax; but the patient in whom I performed this operation remaining in bed, I thought that it was not necessary, nor to use oil for the reduction as some recent author has recommended, because all greasy remedies which relax the parts are absolutely contraindicated, and still less astringents, which contract the internal orifice of the womb and prevent the exit of the lochia."

In Viardel's time the great ignorance of the midwives, the imprudent audaciousness and the want of skill of many surgeons, resulted in a large number of cases of dystocia. He mentions some cases of difficult labor which he treated with great skill and show that he was a man of great resource and experience. Viardel rejected the use of the crotchet, which was used at that time with fearful abuse, and he was a partisan of mild measures, resorting to the embryotome only when he was absolutely obliged to do so. Let me recall here that he was no more favorable to the Cesarean operation done on the living than were Philippe Peu and Mauriceau. The case of Cesarean operation mentioned in his book was performed on a woman who had just died. Here are some of his cases of difficult labor, the first of which is a face presentation:

"One of the unfortunate labors is when the child's face presents foremost in the passage; if this is not promptly remedied all the efforts and all the pains of the mother are frequently useless, so that she will not be happily delivered, if she is not promptly succored, because the child runs the risk of smothering in the passage, all the more so that the pressing pains, pushing the body of the child downward, cause the neck to be bent backwards and the head as well. Now, the true means to resort to in such an

accident are those which I employed during a similar labor that I have described at the end of this chapter.

"In the year 1669, during the month of September, I was requested to deliver the wife of M. Nicolle, a tapestry maker, living on Rue Beaubourg, who had been in labor for two days, and when I had arrived at the house I asked Madame Alexandre, the midwife, what presented, and having made a vaginal examination, I found that the child presented with the face first in the passage; this having been well and duly examined, I placed myself in position to succor the woman and save the child in this way. First I introduced my hand carefully into the neck of the womb, joining my four fingers together and pushing back the face little by little without wounding or disturbing the child in any way, with a compress that I had placed on the extremity of my fingers, allowing it to hang outside the neck of the womb, with a tape attached to the said compress in order to be able to withdraw it more easily when I should have pushed back the face, and I slid my hand gently along the face, as far as the posterior part, that is to say the back of the head, having reached which I endeavored to gently lower it, until the child's chin touched the chest, and, by this means, I placed the upper part of the head in the passage, that is to say at the internal orifice of the womb. This is the means and the method which I employed in the practice of this labor, which, although being difficult, did not prevent me from succeeding as I desired.

"I would add, however, another means by which one may undertake a similar labor, which is as follows: You place your finger in the child's mouth, lowering the lower jaw, or to better extend the chin, in such a way that the end of the latter may touch the sternum.

"I will tell you, nevertheless, that the first method that I have already described, the one which I employed, is the surest and the most certain, from the fact that by placing the finger in the child's mouth, to lower the lower jaw towards the sternum, one runs the risk of dislocating it, a condition which may arise. One should always take care not to wound the child with the ends of the finger when the face is being pushed back, a thing which sometimes happens in these labors. This is why I think it proper that one should use the compress that I have invented and which I have employed quite favorably in this kind of case, to push the child's face gently back and without making any contusion or lesion of the latter, as quite frequently happens on

similar occasions, where the child appears afterwards all livid and injured; furthermore, I would say here that young midwives can sometimes be misled in similar labors, taking the cheek of the child for the buttocks and thus believe that it presents in another posture, which in reality it does not, and on account of this fact they should diligently take care to make a vaginal examination two or three times in order to be absolutely certain. But if, in spite of their exactitude, they still doubt as to the situation of the child, they should send for some surgeon who is well versed in this practice, for fear that they might do something erroneous."

The following case is one of breech presentation and is entitled "Un accouchement que je fis, dans lequel l'enfant présentait le cul, que je reçus en cette situation en l'année 1669."

"The tenth day of April, the wife of M. Boulot, living in rue Saint-Antoine, was at term and in pressing labor pains; her waters had just broken when the child presented in the passage, the backsides first, for which reason I was sent for to deliver her. As soon as I had arrived at the patient's house, I made a vaginal examination and I noticed, having withdrawn my hand, that the fingers which I had inserted in the vagina, were stained a blackish and saffron color, similar to that of the meconium; I recognized from this fact that the child had emptied itself, and, consequently, that it was dead, a fact that I wished those present to recognize, in order to show them that I was not deceived in my prognosis and that things were as I had said, for fear that having come out of the womb one might think that I had killed the child by my operation. Consequently, having observed all the circumstances, relative to both the mother and child, I noticed that the pains increased more and more, so that seeing that it would be useless to oppose Nature by pushing back the backsides of the child, which were extremely engaged in the passage, not being able to insert the hand and considering that it would come down easily in this situation on account of the opening of the internal orifice of the womb, which dilated with each frequent and sharp pain, which obliged me to aid Nature by introducing two of my fingers on each side as far up as the groins, during a strong pain, I drew the child out and the placenta came immediately afterwards.

"It should be remarked that, although I extracted the child in this posture, one should not think that they are all delivered in the same way; in this case one frequently has to go for the feet of the child. After having covered the hand with butter it is introduced into the womb, gently pushing upwards the backsides of

the child, which completely fill the internal os; then one should slide the fingers as far as the groins, carrying the hand along the thighs and legs up to the ankles, and by this means you will find the feet that one may also search for at the posterior part by passing the hand along the thigh and, when a foot is met, it should be drawn out, then one does the same thing to find the other foot; when the hand has them both one should proceed without delay to the extraction of the child in the ordinary manner."

The following is a case of knee presentation: "Among the numerous positions in which the child may present when coming into the world, one of the least difficult to remedy is when it

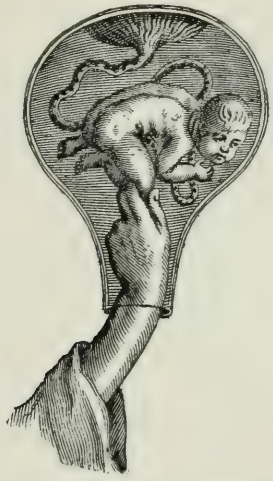


Fig. 5. Version (Viardel).

presents by the knee, which condition can be remedied in a very short space of time if one is a little versed in the practice of obstetrics, because in all bad presentations of the child, no matter what they may be, we are obliged to search for the feet, which are far easier to find when the child presents by the knees, because they are nearer in this posture than in any other, and one can slide the hand below the calf along the leg towards the ankle to catch them and draw them out in the way that I did to the dame of M. Beaudouin, where I was summoned on December 20, 1668, to deliver her, and whom I had previously seen before the membranes had ruptured, who presented longitudinally, which made me recognize that the child was coming badly.

"Because it should be observed that in all labors the waters take on the shape of the part which presents the first in the passage, in such a way that if the child presents by the head, which is the only natural position, the waters, being pushed by the latter, will have a round shape, and if it is the foot or the hand, the membranes will be elongated; in the same way relative to the proportion of the other parts of the body, being careful nevertheless that one commits no error when the child presents by the backsides; because, in this case, the shape of the membranes is quite similar to that of the head, excepting that it is slightly more elongated, or softer, although this sign is not always marked.

"Having noticed this in this woman, whom I mentioned above, I manifestly recognized (when the waters had ruptured) that I was not mistaken in my prognosis, because he was coming with the knees forward. This having been recognized by vaginal examination, I commenced to prepare to succor the woman as promptly as it was possible for me to do, which I accomplished in the following way: I inserted my fingers, pushing the patella of the knee which occupied the internal orifice of the womb, and I slid them along the leg until I caught one foot, and having taken it, I drew it out of the womb and then I inserted my hand along the leg and the thigh as far as the buttocks, and allowing it to slide along the other thigh and the leg, I caught the other foot; and, by this means, being assured that they were two feet of the same child, because one might be deceived when there are twins, in a very short time I happily delivered this woman without any bad accident or danger following either with the mother or the child."

This rapid sketch of Viardel's book is certainly very incomplete, and much more might be said and translated, as, for example, his chapter on monsters, but this would carry us far beyond the intended limits of this paper, which has been written merely to give a fairly adequate idea of the book. I have translated the chapters literally, which accounts for the singular construction and English terms used, as I have been desirous to adhere to the original French text as closely as possible.

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POST-PARTUM HEMORRHAGE.*

BY
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THE treatment of post-partum hemorrhage is something like the education of the rising generation, which Mr. Gladstone once said should be commenced before they were born. If the third stage of labor were always properly managed post-partum hemorrhage would be much more rare. Too great haste in the delivery of the placenta, before the uterus has recovered from the shock and fatigue of a prolonged and tedious labor, may be the cause of a certain proportion of these cases, also failure to properly inspect the afterbirth and membranes for any missing portions which may yet remain inside of and perhaps attached to the uterus. In some quarters the very excellent and safe method of Credé is more honored in its breach than in its observance. The hand on the abdomen following down the contracting uterus and gently massaging the fundus helps much in causing the final contractions, necessary for the expulsion of the afterbirth, and certainly has the very great advantage of giving timely warning of any relaxation of the uterine walls.

The chief cause of post-partum hemorrhage is the failure of the uterus to contract and retract sufficiently to close the mouths of the utero-placental blood vessels, except in those rare and unusual cases where the cervix is so lacerated as to cause a local hemorrhage from its torn vessels, especially the circular artery. Post-partum hemorrhage is also caused by such location of a fibroid tumor as may lead to unequal contraction; also by long-continued and exhausting labors, while just the opposite condition favors its occurrence in other cases.

When a severe and unexpected post-partum hemorrhage does occur, it is one of the most alarming of the incidents or accidents of the lying-in chamber. If the mother is also alarmed her fright will react upon the uterus and make matters worse. It is frequently difficult to allay her fears and excitement when the physician, the nurse, and any relatives who may be present, show unmistakable signs of alarm. I think I have seen

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what I feared would be a defeat turned into a victory by the strongest assurance which my frightened and unsteady voice could give the patient, that nothing unusual had occurred, and that she would soon be all right. Especially is this occurrence alarming when you have nothing at hand with which to combat such an emergency. Probably every careful obstetrician now carries a well-stocked bag to his labor cases, including sterilized gauze and an infusion apparatus. The very strenuous advice given by the President of the United States in regard to our possessing a large and efficient navy might perhaps apply to medical men in attendance on these cases. While a thoroughly equipped mind and obstetric bag might not always ward off post-partum hemorrhage, they would have a vast influence in preventing a threatened defeat. The first severe post-partum hemorrhage I ever saw was when an interne in Bellevue Hospital in 1871. The child and placenta had been safely delivered, the bed and the woman had been cleaned, when, later on, to our astonishment, she was noticed to be deathly pale and said she felt as if she were sinking through the bed. The cover was at once turned down, and while no hemorrhage was apparent, the abdomen was found much distended with the fundus considerably above the umbilicus. Very firm pressure was made on the uterus with both hands, when a big clot shot out, followed by an enormous amount of blood. In this case brisk kneading of the uterus, firm pressure, ice inside and outside, and hypodermic injections of ergot and strychnine saved the day.

There is probably no other occasion when so much blood can be lost in so short a time, and where the need is so urgent to recognize its cause and to be prepared with the few but necessary means for its control as in post-partum hemorrhage. A few moments' delay or inaction may cost the patient her life. We can only hope successfully to meet such an emergency by being prepared for it. Wellington once said his greatest victories were achieved before the battles were fought, and Napoleon maintained that he had conquered the greater part of Europe because the enemy did not know the value of five minutes.

There are three well recognized usual causes of post-partum hemorrhage, namely, retention of the whole or part of the placenta or membranes, which interferes with uterine contraction; a laceration of tissues somewhere in the birth canal involving vessels of sufficient size to permit a dangerous loss of blood—generally in the cervix and lower uterine segment and atony of the uterus.

There is but one thing to do when products of conception still remain in the uterus, preventing its contraction after the birth of the child, and that is to remove them. In case of profuse bleeding the aseptic or rubber-gloved hand should be passed up into the uterus and the placenta peeled off, dilating an hour-glass contraction, if present, arousing by internal manipulation the contractions necessary to expel the hand, membranes, and placenta. If the hemorrhage is diagnosed, by its continued flow after the expulsion of the child, as due to laceration, the fundus being firmly contracted, the woman should be placed in the lithotomy position. In an aseptic environment, the cervix is drawn down within manipulative reach, and the lacerations are closed, being careful to so place the tutures as to include and compress bleeding vessels. Spiegelberg was not far astray, says Hastings of Toronto, in a recent number of the *New York Medical Journal*, when he claimed that grave post-partum hemorrhage is almost without exception the fault of the medical attendant. Atony of the uterus does follow without doubt in the wake of the hasty and mismanaged third stage of labor much more frequently than any other cause: but that this is not always the case may be evident from a brief description of the following case:

Mrs. B. of Cincinnati had narrowly escaped death from post-partum hemorrhage in two former labors while under the care of the best talent in that city. The family came to Washington to live. Soon finding herself pregnant she came under my supervision, and impressed me with the danger of a fatal hemorrhage if the greatest care was not exercised. I was alive to my responsibilities in this case and neglected nothing which could conduce to her safety, so far as I knew. This was about fifteen years ago, before we knew much about gauze packing of the uterus. Although we had a table spread out with ice, hypodermic syringes loaded with ergotine and strychnine, hot coffee and laudanum for rectal injection, vinegar, lemons cut in half, douche bags prepared and filled with hot water, etc., our principal reliance was placed on a strong Faradic battery—in good working order. As the head was pressing in the perineum, one of the nurses, who had been previously instructed in this duty, prepared the battery, placed it under the edge of the bed, attached the electrodes, applied one under the patient's back, and laid one by her side, assuring her all the time that she had nothing to fear.

The child was soon born, and the afterbirth came away within ten minutes. Suddenly, while my hand was still on the uterus, and

after she had swallowed a teaspoonful of fluid extract of ergot, that organ relaxed and the bed was full of blood. I held the electrode in one hand and placed the other over the uterus, while the nurse turned on the current. In less time than it takes to say so, the uterus contracted and did not again relax. A mild current was kept up for a long time. The patient made a good recovery.

While Williams, Grandin, and other recent authors rely chiefly on hot water uterine douches and gauze packing to control dangerous post-partum hemorrhage. I would add the Faradic current, if a battery was on hand and in good working order. It possesses the advantage of being extrauterine and free from septic dangers.

While gauze packing prevents death from flooding, women have died a few days later from sepsis supposed to have been introduced during the hasty and perhaps unsterile operation of packing.

While other methods are worthy of trial and have frequently succeeded in mild cases, they should not be depended on or valuable time lost. If serious danger threatens, the three approved remedies above mentioned should be resorted to at once in the order named—the Faradic current, hot intrauterine douches, and gauze packing.

My experience with the last remedy is limited to two cases, which are briefly as follows: The first case was seen in consultation with Dr. Cuthbert, about five years ago. The wife of a naval officer had been safely delivered of her third child. Soon after the complete expulsion of the secundines relaxation of the uterus came on, and in spite of everything done the flowing continued. Notwithstanding the fact that we had no instruments to aid us, while Dr. Cuthbert held the uterus down I succeeded in forcing, with my fingers, several yards of sterile gauze up into the uterine cavity. The uterus contracted sufficiently upon the gauze, and no further bleeding occurred. As we had no infusion apparatus several saline rectal injections were given, and she drank freely of cold water. She made a good, though slow, recovery, and is alive and well to-day.

The second case I saw with Dr. Percy Hickling, about two months ago. The child had been born the night before and severe hemorrhage did not occur until about 10 A. M. the next day, when it became suddenly very profuse. The doctor came in about this time and found the patient greatly exhausted, and with scarcely any pulse. She was unable to see clearly or to talk coherently. He did all he could with the means at his disposal to arrest the bleeding and to revive the flagging strength of the

patient, and telephoned for consultation. As packing the uterus seemed to offer the only sure means of arresting the hemorrhage, we proceeded as soon as arrangements could be made with this treatment. As the perineum had been lacerated and stitched, she was given a few whiffs of chloroform to keep her mentally and physically quiet, and brought across the edge of the bed. Everything having been made as sterile as possible, I passed my hand into the uterus, cleared out the clots and made doubly sure of an empty cavity by a douche of hot salt solution. I then drew down the cervix and easily packed about ten yards of sterilized gauze, two inches wide, into the uterus, leaving the upper half of the vagina full also; several rectal injections of salt solution were also given.

No further hemorrhage occurred, and the woman escaped what seemed to be impending death. About half of the packing was removed on the following day, and the remainder twenty-four hours later. Barring a slight rise of temperature for a few days, and later on a mild attack of femoral phlebitis, she has made a good recovery.

The effects of post-partum hemorrhage are not simply weakness, pallor, and general, or even pernicious, anemia, but the patient is left in such a state of diminished resistance that she becomes an easy prey to many diseases. She is easily exhausted, and owing to lessened quantity and poorer quality of blood, is subject to fainting attacks, during which pulmonary thrombosis or embolism may occur, with fatal results. Secondary post-partum hemorrhage may occur a few days or a few weeks after labor, caused, in most cases, by shock or some mental emotion. The symptoms and treatment are about the same as of primary post-partum hemorrhage, differing only in degree.

ALEXANDER'S OPERATION THROUGH THE MEDIAN INCISION.*

BY
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Ever since William Alexander of Liverpool, England, on the 14th of December, 1881, performed his first operation of shortening the round ligaments for retrodisplacement of the uterus, the procedure has constantly gained ground, and is now, in its original

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or some modified form, a generally accepted and much practiced operation. It has stood the test of time, is adaptable to all ages and social conditions, and has given good and permanent results in properly selected cases. Other operations for the same condition, such as ventrofixation, ventrosuspension, vaginofixation, and even hysterectomy, have during this time been proposed, strongly advocated, and extensively practiced, only to receive the general verdict, I believe, of being inferior to the shortening of the round ligaments. The operation, originally limited to nonadherent and uncomplicated retroflexions of the uterus, has gradually extended its field to the common cases of retrodisplaced and adherent uterus with diseased and adherent adnexa. The practice in this last class of cases has generally been to open the abdomen, sever the adhesions of the uterus and appendages, treat the tubes and ovaries by removal, or otherwise, according to their condition, and finally shorten the round ligaments intra-abdominally through the same incision or extra-abdominally through the ordinary incisions of Alexander's operation.

Dr. Goldspohn has for a number of years advocated and practiced the extension of the Alexander operation to include this last mentioned class of cases by means of enlarged openings through the inguinal canals into the abdominal cavity, carrying out the same work through these incisions that others do through the median incision.

Without any criticism of other methods advocated and practiced, I shall briefly describe one that I, for the last four or five years, have come to practice more and more to the exclusion of all others in cases of retrodisplacement of the uterus that are complicated with prolapse of more than a moderate degree, or in which I do not feel entirely satisfied that there are no intrapelvic complications.

An incision is made in the median line, above the pubis, three or four inches long, down to the fascia. The skin and adipose tissue are then, by blunt instruments, dissected loose from the fascia on the one side until the external ring of the inguinal canal is exposed. The flap of skin and adipose tissue being held aside by two blunt retractors, the round ligament is picked up, freed in the usual way, and secured by a strip of gauze.

The same procedure is then repeated on the other side. The abdomen is now opened by incision in the median line, and intra-abdominal work carried out in the usual way. In case of prolapse of more than a moderate degree, the sacrouterine ligaments

are shortened. This accomplished, the fundus of the uterus is brought well forward, the round ligaments are pulled out through the inguinal canal, and the effect upon the uterus is ascertained The deeper layers of the abdominal incision, peritoneum, muscle, and fascia are now sutured, the peritoneum by interrupted or continuous catgut sutures, the fascia by interrupted figure-of-eight silk sutures. After this the round ligaments are pulled out to the extent indicated by the previous test and fastened by silk sutures, four on each side, of which three are carried through the aponeurosis of the external oblique muscle and the round ligament, the fourth one securing the ligament to the fascia over the pubic bone. The skin and adipose tissue are then united by means of sutures or adhesive plaster strips, but leaving the wound open enough for free drainage.

The results, both immediate and permanent, have been much better than those of any other method that I have tried, in fact, in a considerable number of cases I know of only one, a case of retroflexed and prolapsed uterus, in which the result, primarily perfect, was spoiled by lack of judicious after-treatment, the patient leaving the hospital too early, and in the joy over her improved condition neglecting the after-care.

The advantages of the method are:

1. That there is only one incision.

2. That this is located where it gives the best access for examination of the pelvic organs and for work in the pelvic cavity.

3. That one opens the abdomen for exploration with much less hesitancy when one can accomplish all work through the same incision, and many of the causes of failure of the Alexander operation may be ascertained and avoided by an exploratory opening of the abdomen.

4. That the intra-abdominal work is limited as much as possible, stitching of the uterus or the round ligaments intra-abdominally being avoided.

5. That it leaves no adhesions or bands between the abdominal wall and the uterus to interfere with the expansion of the bladder, or growth of the uterus in pregnancy, or to cause obstruction of the bowels.

6. That the intra-abdominal relations are left in a condition most closely resembling the normal, and

7. That the part of the round ligaments retained is the thickest and strongest.

SEXUAL FRIGIDITY IN WOMEN.*

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That the discussion of this topic is considered a rather dangerous task is, to my mind, due not to the issue proper, but to the fact that a number of supposedly scientific publications, which truly can be classified as pornographic literature, placed the whole theme in disrepute.

That a serious discussion of these conditions rightly belongs in the realm of gynecology, is proven by the fact that family physicians, who for years were respectable and appreciated counselors of their clients, come and solicit information on this point from the specialist, and that women of high moral and social standing, and mothers at that, report to the gynecologist and ask for relief.

The proper execution of a bodily function is an intrinsic part of the normal well-being; the consciousness of a deficiency in this direction leads to the cognizance of some shortcoming and forces the afflicted individual into a very unhappy mental condition. My remarks are not intended to deal with those cases of sexual frigidity that are based on some primarily abnormal nervous condition, so that this individual never experienced any sexual excitement and orgasm. I simply wish to discuss cases that are characterized in this way: that the patient, in as long as normal conditions prevailed, perceived the normal sexual sensations; that by various causes these faculties were lost, and that this loss is complained of, and that relief is sought by calling in the aid of the physician.

These cases naturally divide themselves into a group, in which the loss of excitation and orgasm can be ascribed to mechanical causes; another group, in which infection and subsequent inflammatory changes can be held responsible; and a third group, in which certain mental conditions lead to a suppression of the normally perceived sensations.

As to mechanical instances, I know of some cases in the practice of others, and in a number of my own, in which lesions of the pelvic floor led to cessation of sexual sensations. In all these cases, extensive tearing of the perineum at the time of labor led to subsequent prolapse. The patients complained that, after cicatrization had taken place and intercourse was resumed, a total absence of the orgasm, previously perceived, was noticed. Proper repair of the parts led in due time to the unimpaired restoration of the temporarily lost function.

* Read before the Chicago Gynecological Society, April 21, 1905.

I do not care to dwell on details, that might be quoted in order to support the mechanical theory in these cases—the fact remains that mechanical conditions apparently stopped the excitation of the orgasm, and that the reconstruction of the normal mechanical conditions was followed by the reassumption of this function.

Certain appliances, used for the prevention of impregnation, seem to furnish another mechanical source of suppression of orgasm. A very popular design of this sort is a collar-button shaped occlusive pessary made out of tin. The upper small button is intended to reach above the internal os uteri, thus keeping the pessary in place, while the lower, larger shield covers the os externum and the surrounding area of the portio vaginalis. Some women, among them a multipara, reported that since using this pessary, the formerly intense orgasm was either reduced quite considerably or was lost entirely. Intercourse resumed after removal of this appliance produced again normal results.

Experiences of this kind seem to support the theory of some experienced observers, who claim that, at least in a certain number of women, the portio is the region for exciting orgasm. Whether the simple covering of the portio is apt to suppress orgasm, or whether the catarrhal conditions of the cervical canal, produced by the stem of the pessary, has something to do with that is so far an undecided question.

Infection and the subsequent inflammatory changes may also lead to suppression of the formerly well developed orgasm. In the chronic stage of gonorrheal infection, for instance, we quite often observe that the clitoris, its hood, the vulva, the urethral caruncle, and the urethral walls are and remain edematous. In such instances it is not unusual to find that sexual sensations are reduced either to a hardly perceptible degree or have even entirely vanished.

I want expressly to state that I do not count those cases in which the inflammatory reaction produces such a hypersensitiveness of the parts that touching them excites pain, so that naturally all other sensations are overwhelmed and overshadowed by the perception of pain. I refer only to those cases in which even quite forcible palpitation fails to elicit pain, and in which all that is left from the gonorrheal process is slight secretion, indolent infiltration, and the above-mentioned torpid edema.

We very probably face here a similar condition which under the same condition is quite regularly to be found in male patients. Loss of the tonicity of the prostate, chronic prostatitis, and chronic posterior urethritis, accompanied by diffuse swelling, will lead to the temporary entire loss of sexual sensations, or will produce a

very torpid sexual reaction, so that, for instance, ejaculation will not be initiated and accompanied by orgasm, but simply will be perceived as the passing of some fluid through the urethra. As treatment and cure of these conditions will lead in the male to restitution of the lost functions and sensations, exactly in the same way appropriate treatment, if allowed by results, will restore the normal sensations in female patients.

Syphilis in its primary stages may also lead to temporary suppression of sexual sensations. Immediately before the outbreak of the roseola, or if vigorous mercurial treatment was begun right away, at the time when the rash would otherwise become manifest, sexual sensations are often reduced to a very low degree or become entirely suppressed.

It is a very well known fact that women who practise promiscuous intercourse as a means of making a livelihood pretty soon gain full control over their sexual sensations; that is, intercourse will not be accompanied by orgasm if they do not permit themselves to raise any sexual excitement.

I quote this as an explanatory premise for the following remarks:

If legitimate intercourse, either on account of so-called irritable weakness (precocious ejaculation, rapid collapse of the penis) on the part of the husband, or on account of practising coitus interruptus, fails to produce proper orgasm, depletion, and satisfaction in the female partner, repeated experiences of this kind will lead to a voluntary repression of sexual sensations in the wife. Sexual excitement not brought to its natural climax and reaction leaves the woman in a very disagreeable condition, and repeated occurrences of this kind may even lead to general nervous disturbances. Some of these unfortunate women learn to suppress their sexual sensations, so as to avoid all these disagreeable sequelæ. Such a state of affairs is not only unfortunate, because it deprives the female partner of her natural rights, but it is also to be deplored because it practically brings down such a married woman to the level of a prostitute.

Considering that information on the points mentioned, for obvious reasons, will always be hard to get, and that the textbooks avoid discussing this matter, every contribution to this subject is valuable. A concerted effort of specialists to investigate the conditions and means of relief should result in placing physicians in a position to remove conditions which too often are the cause of marital unhappiness.

Stewart Building.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

NIAGARA FALLS, MAY 25, 26, AND 27, 1905.

The President, EMELIUS C. DUDLEY, M.D., *in the Chair.*

The President's Address.

THE EXPANSION OF GYNECOLOGY, AND A SUGGESTION FOR THE SURGICAL TREATMENT OF INCONTINENCE OF URINE IN WOMEN.

DR. EMELIUS C. DUDLEY of Chicago read this address. The general law that progress in any direction was characterized by specialization, with its attendant classification and simplicity, had been exemplified in no great movement more strongly than in the development of the medical profession during the last three decades. The late Samuel D. Gross said in substance that specialization had penetrated, with its methods and instruments of research, the innermost recesses of the human body, and in a comparatively brief period had achieved triumphs which general surgery, perhaps, never would have accomplished. He said that in the earlier period, when the specialist confined himself to a particular organ, disregarding its relations to the general system, when frequently exclusive books appeared from this author, specialization was cumbersome, narrow, ineffective, and a hindrance to scientific medicine. Finally, the logical tendency to study each part not by itself but in its essential relations to the whole system, gave rise to such a welding together into a great unit of all the specialties, that any organ, even though recognized in its individual importance and autonomy, at the same time was equally recognized as subject to general law. It then became apparent that physiological and pathological processes were substantially the same, whatever the organ involved. From this time forward laryngology, rhinology, etc., etc., including obstetrics and gynecology, rapidly developed, and became identified in all parts of the civilized world with remarkable groups of men, who had strengthened scientific medicine by building up these departments to an extent unequaled in any other period of history. The progress of gynecology was marked by two pronounced periods, (1) an earlier period, characterized by great activity in the perfection of numerous plastic operations on the vaginal side of the pelvic floor; (2) a later period, which was one of tremendous progress in the surgery of the abdominal side of the pelvic floor. Now a third period was before us, in which gynecology had taken to itself the whole field of abdominal surgery. Dr. Dudley did not believe that gynecology had passed. They were not general surgeons, but were specialists in the diseases of women, and they were to a rapidly increasing extent specialists also in the wider

field of abdominal surgery, a field in which the account of the ledger as it stood to-day would show general surgery indebted to them for a great part of its practical and scientific progress. This claim he believed to be valid. It was not too much to say that their fathers in their day did better plastic surgery than they were doing in ours. Without losing sight of the claims of capital surgery, he believed it was time to bestow adequate attention on the homely, every-day problems of minor gynecology, and to this purpose he ventured to bring forward as an epilogue a small contribution concerning a commonplace though troublesome malady about which the literature was not altogether satisfactory, *i.e.,* incontinence of urine in women.

In the literature up to the present time numerous operations and procedures had been put forward for the relief of this form of incontinence; excluding those not specially pertinent to the subject, they were: (1) Injection of paraffin into the region of the urethra; here there was danger of pulmonary embolism, and this operation would be prohibited. (2) Massage and electricity; this seldom gave permanent results. (3) Torsion of the urethra after the method of Gersuny; this was prohibited on account of the danger of sloughing. (4) Advancing the urethra after the method of Pawlik, Hummelfarb, Albarran, and others.

The operation Dr. Dudley proposed was based on the same principle as Albarran's, but was done without dissecting the urethra free, and therefore it obviated the danger of sloughing of the urethra. It was performed as follows, in two steps: *First Step*—A horseshoe surface was rather deeply denuded between the meatus urinarius and the clitoris, and to either side of the urethra throughout the entire length of it. *Second Step*—The meatus was drawn up to a point near the clitoris, and was secured there by means of two sutures. The lateral portions of the denuded surface were closed. The effect of the operation was to replace and retain in its functional relations the sagging displaced urethra. It would be observed that the two first sutures necessarily stretched the urethra upward to the region of the clitoris and that the lateral sutures tended to hold it in its new position. By this means it was proposed to straighten out the urethrocele by longitudinal traction, and by lateral traction, to collapse and to hold together the dilated walls of the urethra and thus to overcome the sacculation at the neck of the bladder where residual urine was apt to accumulate and give rise to trigonitis, cystitis and possible incontinence. In many cases it would be necessary to combine with the operation some appropriate surgical treatment for an associated cystocele, and in nearly all cases to perform perineorrhaphy to relieve also relaxation of the posterior vaginal outlet. In one case he saw fit to narrow the pouching urethra in order to overcome the urethral dilatation. He said he had performed this operation five times since January 1, 1905. In the first four cases, relief from the incontinence was immediate, and, so far as he could learn, had been continuous. The last

operation was too recent to be taken into account. In one case, there was so much relaxation of the skin and other soft parts in the region of the clitoris that he feared the sutured urethra might pull the structures down to the old malposition instead of being held up by them. But so far it remained well in place. In such a case again, or in the event of recurrence from such a cause, he would be disposed to make a deep oval denudation over the pubes on the mons veneris, just above the clitoris, the longer axis of the oval being directed transversely, and to unite the margins of this wound by a transverse line of union, so as to make the clitoris a fixed point on a sufficiently high plane to hold the urethra taut. For obvious reasons, this procedure would be preferable to the removal of the clitoris and the union of the meatus to the parts thereby exposed. The patients operated upon so far were too few, and the time since the operations were performed had been too short to warrant any prediction of future results. But the meager and unsatisfactory literature on the subject, and the intractable nature of the disorder, led him to place before them his record of his observations.

MIGRATORY UTERINE FIBROIDS.

Dr. Reuben Peterson read this paper.*

Dr. Chauncey D. Palmer of Cincinnati spoke of a case he saw twenty years ago, which demonstrated a number of tumors of this nature, which were undergoing migratory movements. A colored woman came into the ward one day, and died the next from sepsis and from hemorrhage, which had lasted for quite a long period of time. The postmortem was made the next day and inside of the uterine cavity were found two fibroid tumors, which had become severed from the uterine walls at different places; there were also some outside the uterus, and two were found inside the abdominal cavity, one attached to the intestinal surface and one attached to the kidney. He counted seventeen of the fibroid tumors.

Dr. Davenport referred to one case he had seen where a fibroid tumor the size of a baseball had become completely detached from the uterus and was nourished by vessels from the omentum.

Another case he saw a few hours before the death of the patient, in which a diagnosis was impossible. The postmortem showed a large fibroid tumor, which had separated from the uterus, and which was surrounded by dense adhesions and attached to the omentum. It was about the size of a child's head.

Another speaker told of one case he had seen in which the tumor was from 10 to 12 cm. in diameter; it had become freed from the uterus and become anchored in the omentum, and depended upon that structure for its nourishment. Microscopically, it proved to be a myofibroma. Its etiology in all probability was as follows: The woman probably had a single pedunculated myoma; during pregnancy it became attached to the omentum,

* See original article, page 56, July issue.

and, as the uterus underwent involution, the pedicle stretched and a separation occurred.

He saw another case; a small tumor in the same location, nourished by the omentum but less richly supplied with blood vessels, and this had almost entirely become calcified.

Dr. Hunter Robb had seen one such case in private practice a few years ago. He believed these cases occurred much more frequently than was generally supposed from the review Dr. Peterson had made of the literature on this subject. He spoke of one case where there was a tumor about the size of a child's head, and which had absolutely no connection with the uterus or broad ligament, ovaries or tubes. It was wrapped up in omentum and was very intimately adherent to it and received its blood supply from it. Rather than take time to separate the omentum from this growth, it seemed to him wiser to extirpate the whole omentum, which he did.

GASTROENTEROSTOMY.

Dr. William H. Wathen, of Louisville, read this paper. The surgical treatment of acute ulcer of the stomach was indicated in cases that had resisted medicinal treatment, and where the hemorrhage persisted so long or was so profuse as to endanger the life of the patient. It should then be treated by direct drainage of the stomach into the jejunum, with no attempt to heal the ulcer *per se*. Chronic ulcer, with scar tissue in the stomach walls or perigastric adhesions, should also be treated by stomach drainage direct into the jejunum. The same treatment was also indicated in duodenal ulcer. Posterior gastroenterostomy, attaching the jejunum about three inches below its origin under the transverse mesocolon to the lowest part of the stomach, thus eliminating the intestinal loop, should be the operation of election, and anterior gastroenterostomy with the loop should be the operation of expediency to meet special indications or conditions. Anterior gastroenterostomy and also posterior gastroenterostomy with the intestinal loop, with or without intestinal anastomosis between the proximal and distal limbs would finally become obsolete as operations of election. The best results had followed the anastomosis by the double layer of suture. The following conclusions were arrived at:

1. Some cases of acute and subacute gastric and duodenal ulcer and many cases of chronic duodenal ulcer should be treated by efficient stomach drainage into the duodenum or jejunum.

2. Drainage by pyloric divulsion or pyloroplasty with its modifications had not been successful and were now practically obsolete.

3. Gastroenterostomy, as applied by Kocher and Finny, made good and efficient drainage in many cases, but it should be limited to such cases as could not be operated upon by posterior retrocolic gastroenterostomy with the anastomosis near the duodenojujenal flexure.

4. Anterior antecolic gastroenterostomy should not be the opera-

tion of election, but the operation of expediency, and necessitated to give temporary relief or to meet special abnormal conditions that might contraindicate the posterior attachment.

5. The ideal operation of election must be the posterior retrocolic attachment near the beginning of the jejunum and at the bottom of the stomach in the pyloric end, thus eliminating the loop.

6. This gave the most efficient drainage, preventing the vicious circle and regurgitant vomiting, and leaving the intestines and stomach in a nearly normal relation, and was followed by better immediate and ultimate results.

7. The intestinal incision should be made longitudinally and not less than 2 inches long, and the stomach incision should be made of corresponding length, but preferably in the oblique direction. An elliptical strip of mucosa should be excised from both stomach and intestinal incisions.

8. The anastomosis was best made with the continuous suture (Pagenstecher or silk), using the full curved round needle. The suture should be applied in double layers to unite the cut edges of the opening. The outer one-fifth inch beyond the incision should include the serosa and submucous layers.

9. Enteroenterostomy, or closure of the proximal jejunum or pylorus, was not necessary. It meant a traumatism and left a deformity that might cause subsequent bad results.

SUDDEN DEATH DURING OR IMMEDIATELY AFTER THE TERMINATION OF PREGNANCY OR OPERATION ON THE PELVIC ORGANS IN WOMEN.

Dr. Edward P. Davis of Philadelphia read this paper and reported three cases.

Case I.—This patient was a woman of 20 years of age, who had a retained placenta following a criminal abortion. Ether was administered and dilatation accomplished. The placenta was removed with the curette, and the cavity of the uterus irrigated and packed with gauze. Death occurred just before the placenta was removed, with symptoms of profound asphyxia. The ether in this instance was given by a general practitioner. The Coroner's inquest was negative.

Case II.—This patient was a primipara, aged about 20 years, who had a normal pelvis and a normal mechanism of labor. There was a threatened exhaustion during the second stage of labor. The anesthetic, ether, was skilfully administered. A large male child was delivered. There was pumonary embolism and death followed 45 minutes after delivery. During her pregnancy there was a toxemia of moderate severity. There was a bronchial infection, probably influenza.

Case III.—This patient was a highly neurotic woman, about 35 years of age, who some years previously had had a very difficult labor with lacerations and infection. While she was in a rest cure, and without any known cause, she had a pelvic peritonitis on the

left side. Nephritis developed, together with a thrombosis in the left lower extremity. She made a good recovery under stimulation and complete rest, and then she made a request for operation. The ovaries and tubes were removed, as well as the uterine body. Sudden death followed, with symptoms of pulmonary embolism, within 48 hours after the operation. At autopsy there was found a pulmonary embolism. Photographs and drawings of the specimens were shown. The microscopic examination of the organs removed showed a chronic inflammation, following preceding infection. After reviewing the literature, he said, the conclusions drawn fully justified the study of the cases.

One hundred and ninety-three papers on this subject were examined and a table of 25 typical cases was compiled. Sudden death might occur after operation, abortion, or labor from undemonstrable causes. Autopsy findings gave no adequate reason for the accidents. Death might follow abortion, labor or operation, from rapid formation of a pulmonary embolus. These accidents occurred under such a variety of circumstances that it was impossible to designate any one manipulation or stage of labor, or operation, or failure in the mechanism of labor as the cause. In more than half the cases the labor was normal. The accident happened after delivery. It occurred after the use of forceps, after the performance of version, when difficulty was experienced with delivery of the shoulders. In 16,000 puerperal patients Richter collected 20 cases of embolism. Of these, 12 died and 8 recovered. Mallett, in 1800 abdominal sections, collected 6 deaths from pulmonary embolism, 3 after operation for fibroids, 1 after sarcoma of the uterus, 1 after carcinoma of the ovaries, and 1 after cystic ovaries. Fenomenoff, among 1,000 abdominal sections, had 4 deaths from pulmonary embolism. Among 18,800 women in childbirth, or after operation, there occurred 30 cases of immediate pulmonary embolism, of which 22 proved fatal, a mortality of 73.33 per cent.

Patient might die suddenly from primary thrombosis and secondary embolism after labor or operation at a period within one month. These cases were not uncommon. Richter collected 78 in 16,000 parturient patients. Albanus, among 1,140 abdominal sections, had 153 cases of thrombosis. Barrows, of New York, reported 25 deaths after section, 4 from shock, 1 from hemorrhage and secondary shock, and the others from thrombosis and embolism. Clark reported 41 cases of femoral thrombosis after gynecological operations.

Among the rare cases of sudden death in parturient women and operative cases must be mentioned the sudden reflexes resulting from vaginal manipulation. Walter reported death from rupture of the aorta seven days after the birth of twins.

SYMPOSIUM: THE TOXEMIAS OF PREGNANCY.

Dr. J. Whitridge Williams of Baltimore read a paper on the Pernicious Vomiting of Pregnancy. He said:

My attention was particularly directed to the nature of the pernicious vomiting of pregnancy in May, 1903, when I lost a patient at the third month, four days after the induction of abortion, which was undertaken with a pulse of 80 and appeared to give every promise of a satisfactory outcome. Immediately after the operation, the vomiting ceased and the patient was perfectly comfortable for 19 hours, after which she began to vomit again, and soon was almost incessantly expelling small quantities of a brownish coffee-ground like material, without apparent effort. She rapidly passed into a torpid condition and was absolutely unconscious for the last twelve hours of life.

At the autopsy, which I was fortunate enough to obtain, we were surprised to find in the liver and kidneys the lesions characteristic of acute yellow atrophy of the liver.

This case made a deep impression on me, as the patient appeared to die from an acute intoxication rather than from inanition, as is usually stated. While firmly convinced of the toxemic nature of the condition, I must confess that for a time I overlooked the relation which it might bear to the hepatic lesion, and, at first, sought to account for the production of the latter by some of the more usual explanations, and, finding none, was inclined to regard it as an accidental complication.

I soon had occasion to change my opinion, as in the following 12 months I saw, in consultation, 5 other cases of pernicious vomiting, in all of which I felt obliged to terminate pregnancy. Two of these cases died—one at the third month identically as the one just described, and the other at the seventh month, with the jaundice and diminution in the size of the liver characteristic of acute yellow atrophy—thus giving a mortality of 50 per cent. for the six cases.

Unfortunately, all of these cases were seen in consultation in practice and autopsy was permitted only in the case of the one mentioned, and it was possible to make accurate metabolic observations in but two others.

The results obtained, however, were so striking as to place the nature of the condition in an entirely new aspect, and to force me to conclude that some cases, at least, of pernicious vomiting of pregnancy are undoubtedly toxemic in nature, and are associated with serious lesions of the liver and characteristic changes in metabolism.

Since then I have carefully studied a number of other cases, and wish on this occasion to direct your attention to the general conclusions which I have drawn from my experience, and will refer you to the extended article in the Transactions for the full evidence upon which they are based.

Excluding all cases in which the vomiting results from lesions outside of the generative tract, and having no essential connection with pregnancy, and which should be regarded merely as accidental complications, I consider that the evidence at present available

justifies us in dividing the cases of serious vomiting of pregnancy into the following groups:

I. Reflex.
II. Neurotic.
III. Toxemic.

I. Reflex vomiting of pregnancy. This variety of vomiting may be due to the presence of abnormalities of the generative tract or ovum which existed prior to the onset of pregnancy, or are coincident with it. Among such conditions may be mentioned:

(*a*) Displacements of the uterus, particularly retroflexions.
(*b*) Ovarian tumors.
(*c*) Certain cases of endometritis.
(*d*) Abnormalities of the ovum, such as hydatidiform mole, hydramnios, and certain cases of twin pregnancy.

The occasional causal relation of the first two factors may be demonstrated by the prompt cessation of the vomiting following the replacement of the uterus or the removal of the ovarian cyst.

The efficiency of endometritis as an etiological factor is not so clear, although in rare instances the findings at autopsy, or upon the examination of the fetal membranes, afford presumptive evidence that it may be so considered.

The several abnormalities of the ovum mentioned above can readily bring about acute overdistension of the uterus, which, in turn, may cause reflex vomiting. At the same time, however, such a mode of production should not be considered until after examination of the urine has demonstrated the absence of a toxemia.

On the other hand, the abnormal condition of the cervix, so frequently mentioned in the literature, should not be considered as factors in the causation of reflex vomiting, since it is probable that the occasional cures resulting from their treatment are only striking examples of the curative effect of suggestion.

II. Neurotic vomiting. Although Anquetin, in 1865, directed attention to the neurotic origin of many cases of vomiting, and stated that they could frequently be cured by suggestion, it was not until the address of Kaltenbach, before the Berlin Obstetrical Society, in 1890, that such a mode of origin has been seriously considered. Since then many writers have contended that most, if not all, cases of vomiting of pregnancy are neurotic in origin and more or less closely allied to hysteria and were amenable to suggestive treatment.

I consider that such a view is far too extreme, but I, nevertheless, believe that it holds good for many cases. For it is only by means of such an hypothesis that one can comprehend the surprising and rapid cures which sometimes so promptly follow the employment of absolutely worthless and unphysiological remedies, as well as the effect of suggestion and the rest cure.

At the same time, this variety of vomiting should be diagnosed only after excluding organic lesions and demonstrating the absence of toxemia, by a most thorough examination of the urine.

III. Toxemic vomiting. As far as I can learn, Fischl, in 1884, was the first to suggest the toxemic nature of the condition, which he attributed in his case to the absorption of toxic materials from the impacted large intestine.

Shortly afterwards attention was directed to the occasional occurrence of multiple neuritis in women suffering from severe vomiting of pregnancy, and it was suggested by the earliest writers upon the subject that possibly both conditions were due to the circulation of some toxic material in the blood.

During the past ten years this conception of the vomiting of pregnancy has taken a more and more prominent position, and many attempts have been made to place it upon a secure foundation —all sorts of theories having been advanced concerning the origin and nature of the toxic material—among which may be mentioned:

(*a*) Secretion of corpus luteum.

(*b*) Secretion of ovary.

(*c*) Absorption from intestines.

(*d*) Hepato-toxemia (Pinard and Bouffe de St. Blaise).

(*e*) Invasion of maternal organism by fetal elements, the syncytio-toxin theory of Veit, Behm, and others.

(*f*) Its identity with eclampsia on the one hand and acute yellow atrophy on the other—Champetier de Ribes and Bouffe de St. Blaise, Stone, Ewing, and Edgar.

That pernicious vomiting stood in some relation to disturbed function of the liver was suggested by the fact that not a few women in the last stages of the disease presented an icteric hue or had marked jaundice. Matthews Duncan, as early as 1879, suggested that some of the fatal cases were really examples of acute yellow atrophy of the liver, but his teachings evoked but little interest and were soon forgotten.

Just about this time I observed the case mentioned at the beginning of this article. Stone, of New York, had a similar experience and published a description of his case in December, 1903. He took the ground that the vomiting of pregnancy, eclampsia, and indeed most of the disturbances of pregnancy were manifestations of one and the same toxemia, which he attributed to a primary disturbance in the hepatic function. Similar views were also enunciated by Ewing, of the Cornell Medical College, and Edgar within the past year.

I had the opportunity to examine the sections from the liver of Stone's case, and found that they were absolutely identical with those from my own. Accordingly, from my own experience, as well as that of Stone and Ewing, I have no hesitation in saying that in at least a certain proportion of the toxemic cases of vomiting of pregnancy, characteristic lesions may be found at autopsy—and are identical with those observed in acute yellow atrophy and icterus gravis.

These consist in the degeneration and necrosis of the central portions of the liver lobule, and the fatty degeneration and necrosis of

the secretory portions of the kidneys, and can only be explained by the assumption that some powerfully toxic substance is circulating in the blood.

Moreover, in addition to those already mentioned, I have found five other cases in the literature in which acute yellow atrophy was found at autopsy upon patients dying from vomiting of pregnancy, as well as five others in which marked fatty degeneration of the liver was noted.

When one considers the marked disparity of the statements as to the autopsy findings in pernicious vomiting cases in general, and its association with so rare a lesion as yellow atrophy in ten cases it would seem that it must rest upon something more than a mere accidental coincidence, and that some direct connection must exist between the two processes.

Of, course, one may object that the usual clinical history of acute yellow atrophy in pregnant women speaks against such a connection, as it is well known that the majority of cases recorded in the literature occurred in the second half of pregnancy, and usually in the last three months. At the same time, this is not an absolute rule, as a number of cases were observed at the third and fourth months, while Le Masson and Beatty noted the condition at the sixth and eighth weeks respectively.

Moreover, it is more than likely that not a few cases accompanying vomiting in the early months were completely overlooked, as a large part of the autopsies were performed in private houses by persons not particularly skilled in pathological technique, and while searching for changes in the generative or gastrointestinal tract gave but scant attention to lesions in other organs.

Indeed in several of the cases in which yellow atrophy was observed, the authors considered it merely as an accidental condition, and attributed the vomiting to some trifling lesion—such as a cervical catarrh.

It is also possible that the effect of the toxemia may vary in the different periods of pregnancy, giving rise to vomiting in the early and the characteristic symptoms of acute yellow atrophy in the later months, though I feel that we are probably justified in holding that we have to deal with the same toxic agent in both conditions.

At present we are absolutely ignorant as to the exact nature of the toxic substance or substances concerned, though in the present state of our knowledge it would seem most natural to suppose that they are metabolic in origin and are directly connected with pregnancy—though whether derived from the mother or fetus, or both, is not known. All that we can state definitely at this time, is that in some cases of pernicious vomiting we have to deal with a toxemia, which gives rise to serious lesions in the liver and later in the kidneys, and that the latter are secondary in character, as is indicated by the fact that the urine does not contain albumin until shortly before death.

Associated with these lesions is a striking change in metabolism, which is manifested by a marked increase in the percentage of nitrogen put out as ammonia compared with the total nitrogen of the urine, so that the former, instead of being 3-5 per cent. as normal may rise to 16, 32, or even 46 per cent., as in several of our cases.

Whether this increased ammonia coefficient is due to the fact that the marked destruction of liver tissue interferes with the normal oxidation of nitrogenous material, so that large amounts escape conversion into urea, and are, therefore, excreted in a less highly oxidized form, as ammonia, or whether it merely represents an attempt to neutralize an excessive production of acid—a so-called acid-intoxication—is as yet undecided. Reasoning by analogy, it is probable that the latter is the case, just as in diabetes, phosphorus poisoning, and numerous other conditions. But at the same time it is advisable to avoid hasty conclusions.

However this may be, the practical outcome of my experience is that a marked increase in the ammonia coefficient in women suffering from pernicious vomiting indicated the existence of a serious toxaemia, which if allowed to continue will be found to be accompanied by lesions of the liver and other organs inconsistent with life. Accordingly, under such circumstances, abortion should be induced as soon as the condition is detected, as it offers the only hope of checking the toxemia and saving the life of the patient.

My experience has not been sufficiently extended for me to lay down definite rules as to how great an elevation in the ammonia coefficient is consistent with the safe continuance of pregnancy. But until further experience demonstrates the contrary, it would seem safe to assume that an ammonia coefficient of 10 per cent. represents the danger signal, and as soon as it is reached immediate interference is demanded.

On the other hand, in the reflex and neurotic forms of vomiting, the ammonia output remains normal, and accordingly the determination of the ammonia coefficient affords not only a means of diagnosis between the neurotic and toxemic varieties of vomiting, but is a most valuable guide as to treatment.

Thus, one may have to deal with two women, who are apparently equally seriously sick, as far as one can judge from the usual clinical point of view, and may find in the one a high, and in the other a normal ammonia coefficient. In the former case my experience has taught me to urge as strongly as possible the termination of pregnancy, and even then to express a guarded prognosis; while in the other, I give a favorable prognosis, put the patient to bed and institute a more or less absolute rest cure, and confidently expect her to cease vomiting in two or three days, and to be up and about within a week.

While I agree with Stone and Ewing as to the anatomical lesions found in certain cases of vomiting of pregnancy, I must take sharp issue with them when they contend that the toxemic vomiting,

acute yellow atrophy, and eclampsia are manifestations of one and the same toxemia.

My experience is just the opposite, as it has taught me that there are at least two toxemias of pregnancy, and probably more, one due to acute yellow atrophy, and the other to eclampsia. This conviction is founded upon careful study of the pathological anatomy, clinical observation, and metabolism in these two conditions.

In both, necrotic lesions occur in the liver, but these differ in character in the two diseases, and need to be seen only once to be appreciated.

In eclampsia the lesions begin in the portal spaces and invade the lobule from the periphery toward the center; while in vomiting of pregnancy the necrosis begins in the center of the lobule and spreads peripherally and never involves the portal spaces.

A personal letter from Schmorl, who first recognized the significance and importance of the liver lesions in eclampsia, and who has had the most extended experience in studying this condition, absolutely confirms my contention.

In most cases of eclampsia and preeclamptic toxemia there are marked signs of involvement of the kidneys and general circulation—as manifested by scanty urine in proportion to the intake of fluid, the early appearance of pronounced albuminuria, and the presence of casts and edema.

In vomiting, on the other hand, the urinary output is diminished only as the intake of fluids is interfered with, and albumin and casts are present only in the last days or hours of life, while edema is absent.

Chemical examination of the urine shows an equally marked contrast between the two conditions. In eclampsia the total amount of nitrogen is greatly diminished, while the ammonia coefficient remains practically normal. In vomiting, on the contrary, in spite of the scanty amount of urine, the amount of total nitrogen remains approximately normal, while the ammonia coefficient is wonderfully elevated.

Generally speaking, it may be said that a high ammonia output is a favorable prognostic sign in eclampsia and a very ominous one in vomiting.

THE TREATMENT OF ECLAMPSIA.*

Dr. Franklin Spilman Newell of Boston read this paper.

ECLAMPSIA AND ITS TREATMENT.†

Dr. Cyrus A. Kirkley of Toledo read this paper.

*See original article, page 339.

†See original article, page 347.

VAGINAL CESAREAN SECTION IN CASES OF ECLAMPSIA.

Dr. Henry B. Fry of Washington, D. C., presented this paper. Single and multiple incision of the cervix have been practiced for a long time, but the credit for bringing before the profession the value of the deep cervical incision, or incisions, is generally given to Dührssen, although the first vaginal Cesarean section was performed by Acconci in 1895.

The chief indication for its employment, and that which has mainly led to its adoption, is the prompt and easy emptying of the uterus in cases of grave eclampsia. Other indications claimed are cancer of the cervix, rigidity of the os, threatened rupture of the uterus, prolapse of the funis, placenta previa, heart disease in the pregnant woman, and hemorrhage from the normally implanted placenta.

Personally, the writer entertains grave doubts regarding the application of this operation, or any method of *rapid* dilatation, to the treatment of placenta previa. The reduced maternal mortality from this serious complication is largely due to recognizing the value of slow dilatation. One might be tempted to employ it in a case of placenta previa complicated by a long undilated cervix, but this condition presents the limited field assigned to abdominal Cesarean section.

If the vagina is not capacious, and if the vicious insertion of the placenta be central or nearly so, he believes better results to mother and child are secured by the classic Cesarean section.

Summing up the various indications for this new operation, we recognize its wide scope of usefulness in the treatment of grave eclampsia. It is not intended to replace the slower method of dilatation in less urgent cases, but when a woman is on the verge of convulsions in spite of active treatment to prevent them, or when convulsions have occurred and the uterus must be emptied rapidly. Prolonged efforts at manual or instrumental dilatation may precipitate the attacks.

That manual dilatation in itself is not sufficient to meet the situation in all cases is demonstrated by the recent impetus given to the employment of different kinds of steel dilators. Dr. Harris himself, to whom the credit for manual dilatation belongs, has brought out a very ingenious steel dilator.

The advantages of vaginal Cesarean section are, first, the rapidity with which the uterus can be emptied. From six to ten minutes is all the time that operators have reported necessary, and as they become more familiar with the technique it may be further reduced. Few operators have done more than one or two operations. Twenty to thirty minutes should complete the sewing up of the wound. There is little traumatism, and a clean surgical cut to sew up instead of leaving a lacerated surface. In eclampsia the blood loss resulting from the operation is beneficial, and the patient is returned to bed in the best condition to overcome toxemia.

Case.—Nov. 18, 1904, I was called to see Mrs. A., in consultation with her family physician, Dr. Wade Atkinson. She was about six months advanced in her second pregnancy, the first pregnancy having terminated prematurely about five years ago.

There was anasarca, and she was suffering from headache and nausea, epigastric pain, and dimness of vision. These symptoms began about three week before my visit. The urine was solid when tested with heat and nitric acid.

I advised immediate emptying of the uterus. She was transferred to the hospital and vaginal Cesarean section performed that evening. The os admitted one finger, but was not dilatable. Wetherill's method of "ironing" out the cervix was tried for ten minutes, but made little impression. The bladder was dissected from the cervix and held up by a retractor. The anterior lip of the cervix was bisected, the incision extended through the internal os and was 3½ or 4 inches long. The hand was introduced, the uterine opening dilated, podalic version performed, and the infant delivered. The placenta came away naturally, and a hot intrauterine douche was administered. The cervical incision was then united with catgut and a gauze drain placed between the cervix and bladder.

The infant lived about six hours. From the beginning of the incision to the extraction of the infant was seven minutes.

The entire operation was completed in twenty minutes. The urine cleared up rapidly and in three days there was no albumin found. All the toxemic symptoms disappeared, and in this respect she made a rapid convalescence, except for a time she suffered from albuminuric retinitis.

Urine escaped from her vagina, and her recovery was complicated by a small vesicovaginal fistula, which later was closed.

Technique of the Operation.—The anterior lip of the cervix is caught with two pairs of bullet forceps, placed on each side of the median line. It is drawn down and the mucous membrane incised for an inch and a half, laterally, at the point of reflection. The bladder is dissected off as high as the peritoneum, and a long, narrow retractor serves to elevate it and expose to view the anterior surface of the cervix. The separation of the bladder can be made with a blunt dissector, or the finger, but it is safer to cut the bands of connective tissue with blunt pointed scissors, otherwise sufficient force may be employed to tear the viscus. Instead of attempting to push up the tissues in the median line, it is better to work at each end of the incision, in order to get under the sides of the utero-vesical ligament and sever it from the cervix. If a larger field of exposure be desired, a second incision can be made longitudinally downwards in the anterior wall of the vagina, extending from the middle of the transverse incision to near the meatus.

These points have been prominently brought before the profession by Dr. Goffe in his vaginal work on the uterus and its appen-

dages. This dissection of the bladder may be carried at once to the point of reflection of the peritoneum, or the cervix can be bisected as the dissection progresses, bullet forceps being changed to catch each side at the angle of the cut, drawing down and exposing to view fresh cervical tissue. The cervical incision extends from the external, to and through the internal os. There is not much bleeding. The instruments are now removed, and the hand inserted in the vagina, the uterine opening stretched and the forceps applied, or version performed.

An incision of the posterior lip will not be required ordinarily, unless the infant be large. After emptying the uterus, the cervix is caught with bullet forceps on each side of the incision; it is drawn down and the retractor inserted to hold up the bladder anteriorly. The incision of the cervix is closed with catgut, and the vaginal wound sewed up. Some recommend a gauze drain between the cervix and bladder.

If there should be too much bleeding from the uterine cavity a gauze packing can be inserted. In cases of eclampsia a certain amount of hemorrhage is beneficial, unless the patient is too much exhausted.

Dr. Edward P. Davis said that it was a great pleasure to him to know that the toxemia theory had gained so much ground.

With regard to Dr. Williams' paper, it was often very difficult to make the two classes, (1) neurotic and (2) reflex. Often one found it almost impossible in neurotic women to make a definite statement that the condition was not a reflex one originating in pregnancy. He thought they were enabled to make but two classes, the one class neurotic, which included the reflex, and the other the toxemic.

The vomiting of pregnancy might be caused by the absorption of syncytial elements. He relied largely upon the examination of the blood to determine whether or not pregnancy should be interrupted. When the blood showed evidences of disintegration he usually advised emptying the uterus without delay. He was in accord with Dr. Williams' recommendations.

With regard to Dr. Newell's paper he was much in sympathy with its meaning, although he did not believe that eclampsia came from the toxemia. The syncytial condition rarely, if ever, caused eclampsia. He was in accord with Dr. Newell in his statement that renal types of eclampsia were favorable cases; they did not die as they did in the hepatic type, and were favorably influenced when the proper treament was instituted. One could differentiate several types of toxemia, such as the hepatic, the renal, the thyroid, the intestinal, etc.

With regard to the immediate delivery of the patient, he had a word or two to say. To-day there were two views presented. Was it good for a woman with eclampsia, or on the verge of eclampsia, to be delivered as soon as possible without previous treatment? In other words, one view called for delivery of the

patient as really the first treatment. Supposing that one had brought to him a patient suffering from, or about to suffer from, eclampsia; the question would arise as to Cesarean section, whether the vaginal or abdominal route should be chosen. The choice of route depended upon the operator and the question of time. He had been informed that the vaginal method consumed from 20 to 35 minutes, whereas the abdominal route required from 30 to 45 minutes but the Porro operation demanded but 35 minutes, including the closing of the abdomen. If a few minutes were to count as being of much value, then the vaginal rather than the abdominal route must be the one of choice. There was one sort of delivery that he was very much opposed to, that preceded by dilatation of the cervix. He believed dilatation of the cervix in this way added additional trauma and shock, no matter how accomplished, whether by Bossi's dilators, or bags, or any sort of dilatation by hands or otherwise, and he wished to protest against it. When a woman became eclamptic, or was on the verge of a seizure, a certain amount of blood might be extracted, the amount depending upon the patient's condition; immediately after give an intravenous injection of saline solution, and apply the hot pack. The stomach should be washed out. Calomel, veratrum viride in small doses, etc., should be administered until the patient entered labor. So soon as dilatation had proceeded at all, and the patient showed signs of approaching labor, she should be delivered by forceps or version. There was no choice between these methods. Given a skilled operator and a hospital where proper attention and skilled assistants could be had, and with the woman in good condition, he believed Cesarean section was justifiable. Unless such conditions existed the physician should treat the patient by elimination until labor began, and then he might be able to extract the fetus with little or no violence. One should always consider the life of the mother before that of the fetus.

Dr. Edward B. Cragin of New York for some time had believed that the severe vomiting that occurred during the later weeks of pregnancy was toxemic in origin; whereas the vomiting that occurred during the early weeks of pregnancy might be either toxemic or neurotic.

Some sections made by the pathologists from specimens removed from patients under his personal observation at the Sloane Hospital had not shown the distinct dividing line between the lesions of acute yellow atrophy and those of eclampsia which Dr. Williams had indicated in his paper and his drawings. In some of his cases of eclampsia the necrosis had not been confined to the periphery of the lobule, but had extended as well to the center, showing that border-line cases occur in which the exact differentiation indicated by Dr. Williams was almost impossible.

Dr. Cragin said that five years ago he lost two cases which had presented all the clinical features of eclampsia. An autopsy was performed, and the pathologist reported that they were cases of acute yellow atrophy. He remembered telling the pathologist that

the clinical picture was certainly that of eclampsia, and asking him if the two conditions were not identical. Certainly cases of eclampsia occur in which the lesions in the liver so closely resemble those of certain stages of acute yellow atrophy and good pathologists are unable to positively differentiate them.

With regard to the treatment of eclampsia, he said that a year ago he would have endorsed all that had been said by the readers of the papers to-day concerning the efficacy of venesection and saline infusion, as he had just begun to try them. At that time he came before the society with a series, during the year, of six cases of eclampsia, with only one death. Since then, influenced by the numerous favorable reports from venesection and saline infusion in eclampsia, he had tried this method at the Sloane Hospital and to-day his record for the year was bad, as he had lost 9 cases during the year. He said that a few facts bearing on this point might be of interest.

In his six years' experience at the Sloane Maternity there had come under his care 115 cases of eclampsia, and of these 20 had died, or 17.4 per cent. In the 20 which died, venesection had been done in 5; intravenous saline infusion in 13. In the 95 which recovered, venesection had been done in only 7, and intravenous infusion in only 9. In the series of 31 cases of last year, with only 1 death, venesection was done only 4 times and intravenous saline infusion only 6 times, and the one which died was infused. Of the last 10 cases which died, 9 were infused intravenously and 4 had venesection. He admitted the difficulty of prognosis in cases of eclampsia brought to a hospital having an ambulance service, as many of the cases were hopeless on admission, and no treatment would save them, and the type of the cases at the Sloane during the past year had been very severe. But the figures just given were certainly instructive, and he had recently given orders to his staff to return to the treatment of a year ago when venesection and intravenous infusion were seldom performed.

It seemed to him that the uterus could be allowed to lose blood enough, when indicated, to avoid the necessity of venesection in most cases, and that saline solution per rectum or subcutaneously would give the good effect of the saline, without the danger of edema of the lungs, which was sometimes associated with intravenous infusion.

The treatment which had been followed at the Sloane Maternity when the results were the best was as follows:

Chloral per rectum; chloroform during the convulsions; hot wet packs if the patient was in good strength; colon irrigation or saline enemata, depending upon the tolerance of the patient; veratrum viride if the pulse was strong and rapid.

If the patient was not already postpartum when the convulsion occurred, the uterus was emptied as speedily as was consistent with the integrity of the lower uterine segment.

If the cervix was soft and dilatable, it was manually dilated and version and extraction were performed.

If the cervix was long and rigid, the above was preceded by a preliminary softening and dilatation by means of elastic bags.

Dr. A. Lapthorn Smith wished to say a few words regarding treatment. During his first 15 years of practice he made it an invariable rule to empty the uterus as soon as danger appeared. But during the past 10 years, although he was ready at all times to empty the uterus in cases of eclampsia, still he was adopting other treatment first. The bowels should be cleaned out.

With regard to eclampsia, the theory was growing that it was caused by toxins; toxins were nitrogenous in nature and therefore, nitrogenous material should be eliminated from the diet as much as possible. The patients should be given plenty of water. These toxins caused anemia of the brain and kidneys, especially when the convulsions began. To him the real treatment seemed to be in relaxing spasm; therefore, when called to a case he first gave a hypodermic of morphine and ten minims of veratrum viride every ten minutes until the pulse fell to 40. Since he had been using veratrum viride he had not lost a case of eclampsia. He advised the giving of enemata of salt solution, washing out the poisons, and giving the kidneys a chance to work after the arterial spasm had been prevented. He said he had given up the use of chloral, and he believed that many deaths were due not to the eclampsia, but to the chloral; the heart could not tolerate the doses given. He had given up bleeding. His attitude towards eclampsia now was not to empty the uterus immediately. He hoped that more attention would be given to the prevention of eclampsia by cutting out the nitrogenous articles of diet and giving more water.

Dr. Reuben Peterson had been particularly interested in what had been said regarding the etiology and the pathology, especially that outlined by Dr. Williams. If his deductions were true, then they had something definite to gauge these cases with.

With regard to the operative treatment of eclampsia by the vaginal Cesarean section, he believed that it was very important that every case should be reported. The majority of operators had had an experience with but two or three cases. He wished to record the following. A woman was brought to the hospital in convulsions. She was about 22 years old and was six and a half months pregnant. The cervix was rigid. Fearing the bad effects of dilating the cervix he did a vaginal Cesarean section. The operation was performed according to the lines laid down by Dr. Fry, a "T"-shaped incision being made; this enabled him to free the bladder walls better than by a transverse incision. The incision into the uterus was 3½ inches in length, and, with the use of the forceps, the child was delivered without difficulty. There was no bleeding. Drainage was employed because he found that after dissecting the bladder there was some, although slight, hemorrhage. The convulsions immediately disappeared and the woman made a good and complete recovery. The child lived but a few minutes. He believed this was a very simple method of treatment in cases

with rigid cervices, and was indicated in normal pelves more than the ordinary abdominal section.

Unless a man was accustomed to this kind of work this was not an operation for him to attempt. Forcible dilatation, according to the manner of Harris, would be preferable.

He protested against dilatation with the Bossi dilator. All instruments were dangerous in such cases and should not be used.

Dr. P. A. Harris said that physicians who recommended section of the uterus to effect delivery of the child certainly could not have succeeded with any method of dilating it. There were cervices which would not yield to dilatation without laceration. He had seen a case of cancer of the cervix in a pregnant woman, and here the cervix must have been torn or cut. But in a large percentage of the cases, the fingers could dilate the cervix sufficiently to permit the ready extraction of the child. The cervix could be dilated with the fingers. Still, he now had an instrument which showed how many pounds was being applied and registered how dilatation was going on. With the patient on the table, the child could be readily delivered and without any hemorrhage, although he took a longer time than when manual dilatation was done. Dr. Harris was giving up mutilating operations when dilatation could be accomplished with the hand or proper instruments.

Dr. Seth C. Gordon believed that the giving of saline solutions was one of the most important and valuable things in the treatment of these cases, repeating them once or twice in the twenty-four hours. Unless patients were in eclampsia, he did not believe any one could forecast an attack. An attempt made to dilate the cervix in these cases he believed to be a mistake, and it should not be attempted unless the patients were absolutely in convulsions.

Dr. Frederick W. Sears of Syracuse was exceedingly interested in Dr. Williams' paper. He had never seen a patient die because of the vomiting of pregnancy. With regard to the repetition of the vomiting it was his experience that it occurred more severely at subsequent pregnancies than during the first. On the contrary, the eclamptic attacks were not repeated in subsequent pregnancies. He reported, briefly, one case of this kind. This patient was profoundly eclamptic, had had four seizures, and was unconscious for twenty-four hours. She went through her third pregnancy without any albuminuria or abnormal symptoms whatever.

With regard to manual dilatation of the cervix, he stated that he had had considerable experience with it and he had never regretted employing this means. Seven years ago he felt convinced that he was losing too many babies in eclampsia, and it occurred to him that more attention should be paid to their welfare; consequently he began to effect delivery in a way that he had not been in the habit of doing. He dilated with the fingers sufficiently to get three fingers in the uterus; then the membranes were ruptured, forceps applied, and delivery accomplished slowly. Since then he had delivered five cases in this way, and all the mothers and babies had been saved.

Dr. William S. Stone of New York (by invitation) had made some observations during the past few months which he thought might be of value in this discussion.

When he wrote his paper on "Toxemia of Pregnancy," in December, 1903, it was not generally accepted that the vomiting of pregnancy had a toxemic origin; nor was it generally accepted that the lesions in fatal cases of vomiting of pregnancy were analogous to those found in acute yellow atrophy of the liver. The point he had especially tried to make in his paper was that the vomiting of pregnancy was of a toxemic origin similar to that of eclampsia, although he was willing to admit that the lesions Dr. Williams had so well demonstrated corresponded in general to those of acute yellow atrophy of the liver, and that there were also lesions corresponding to the eclamptic type having their own characteristics, but he still maintained that there were border line cases, as described by Dr. Cragin; in one case there had been no vomiting at all and no symptoms of eclampsia, and the woman died a few hours after a normal delivery. The liver presented the picture of both eclampsia and acute yellow atrophy.

Dr. Stone said that in regard to metabolism as shown in the urinary changes, he had had under observation three severe cases of vomiting of pregnancy in which the following changes were noted: Case I. had been vomiting severely for four weeks, no albumen or casts, the urea, as determined by the hypobromite method, was higher than normal, the total nitrogen was slightly decreased, the urea nitrogen represented about 80 per cent., the ammonia nitrogen and the amido-acids were practically normal.

Cast II. was characterized, clinically, by vomiting, ptyalism, slight jaundice, and intervals of almost maniacal delirium. The urinary changes were as follows: The urea nitrogen amounted to only 47 per cent., the amido-acids were increased to 27 per cent., the ammonia nitrogen practically was normal.

Case III. terminating fatally, showed the amido-acids increased to 19 per cent., and the ammonia nitrogen to 15 per cent. His results, then, with the ammonia nitrogen had not been so uniform as those presented by Dr. Williams.

He would record in this connection the results of the urinary examination made from a patient who suffered from headache, nausea, vomiting, and severe prostration at the time of each menstrual period. A 24-hour specimen of urine taken the day before menstruation began showed the urea nitrogen to be only 47 per cent., the amido-acids increased to 19 per cent., and the ammonia nitrogen to 15 per cent. A urinary examination made midway between the periods showed the nitrogen partition to be normal.

Dr. Stamm of Freemont, Ohio, said that in vaginal Cesarean section conservatism appeared to be too radical. Originally this operation was undertaken for cancer and sepsis. Conservatively, it was undertaken for eclampsia, uncontrollable vomiting, heart affections, rigidity of the cervix, tetanus uteri, hemorrhage, etc. It seemed to him that the different views expressed regarding the

treatment of eclampsia were contradictory. It appeared that a happy result should be had in 80 per cent. of these cases, and therefore, a man who lost a case of puerperal eclampsia showed that he had adopted improper methods. He had had three cases that came to his care in succession, and he arrived at the one conclusion: "cure them by preventing pregnancy." He agreed with what had been stated about dilators; he did not think it right to add more than a woman could bear, and the use of these dilators added much to the danger.

Dr. J. Riddle Goffe said the subject of vaginal Cesarean section had been discussed frequently during the past winter. He related the case of a woman who had advanced to the sixth month of pregnancy, and who had been in labor for six days, and with a dead child. He found there was a long contracted cervix, which he tried to dilate, but failed. He then decided upon vaginal Cesarean section, which was easily performed, the fetus being turned and delivered. It was very quickly done and was a simple matter. No hemorrhage resulted. He made a "T"-shaped incision in the anterior vaginal wall and stripped the bladder away; the incision made in the elongated cervix was about 2 inches in length. The incision was closed with sutures, and the woman left the hospital on the tenth day.

Dr. Eugene Boise had had a great many cases of eclampsia to deal with and not one had died. He had never delivered the fetus by the Cesarean section or by manual dilatation of the cervix. Such cases should be left to nature's care. In one case he believed that Cesarean section was indicated because of extreme rigidity of the cervix. But he applied 6 or 8 drops of a 2 per cent. solution of cocaine and in 15 or 20 minutes he delivered the woman of her child with forceps and with ease. The cervix was then dilated like a wet cloth.

Dr. Whitridge Williams, in closing his part of the discussion, said that he probably was not well understood when he made the distinction between reflex and neurotic vomiting which occurred during pregnancy. He intended to leave out reflex vomiting entirely. There were cases of vomiting due to certain abnormalities which ceased when these abnormalities were corrected; these belonged to the reflex type, a type he did not intend to speak about. Again, there were a certain number of cases due to the syncytial elements, a view advanced some time ago, along the lines of Ehrlich's side-chain theory; this had not been satisfactorily demonstrated.

Reference had been made by some speakers in regard to the presence of acetone and certain acids in these cases; this was not surprising, because in every case in which there was an acid intoxication these elements could be found. He was not sure that the vomiting of pregnancy was due to an acid intoxication.

He was strongly of the opinion that the lesions of eclampsia were quite characteristic. He had examined the livers of 20 eclamptic women and found characteristic lesions. If anyone

brought to him sections of the liver that showed such lesions he would immediately say that such a woman had been eclamptic. Dr. Welsh, too, had told him that such lesions were quite characteristic of this disorder.

Dr. Franklin Spilman Newell of Boston did not wish to be understood as saying that every case of toxemia of pregnancy demanded immediate delivery. He first tried to lessen the amount of toxemia in these cases, and if in a short time there was no increase in the amount of urine and other changes showing elimination was deficient, then he advised immediate delivery. On the other hand, the first convulsion was the first indication that the pregnancy should be terminated; that was the most serious factor in the disease and must be stopped. Hyoscine or morphine would control the convulsions immediately, and the patient should not be allowed to come out of their influence until elimination had been thoroughly established. In such cases morphine did not check the secretions. By diminishing the sensibility of the spinal cord or cerebrum it permitted the vasomotor spasm to become relaxed and the excretion was favored.

Dr. Henry D. Fry said that one of the chief diseases encountered at the hospital was eclampsia; cases came in when in convulsions. The treatment there was to administer morphine, veratrum viride, in some cases bleeding, purgatives, etc., and they had a mortality of 8 or 10 per cent.

With regard to the use of bleeding and veratrum viride, he said that when the pulse was fast veratrum was indicated; but when there were convulsions and a strong pulse, then bleeding was indicated; in other words, the pulse was the guide. Veratrum was used ten times to bleeding once among their cases. When the former was used it should be pushed till the physiological effect was produced. Start in with injections of 10 minims given repeatedly until the pulse was below 100, and when the pulse reached this point, or below, the convulsions would cease.

He agreed that the use of the saline solution more often did harm than good, but when used it should be given subcutaneously or by the rectum, and in large quantities. Recent studies had shown that in some cases of nephritis with insufficient kidney action, the output of chlorides being diminished, salt solution increased the kidney insufficiency and produced edema and a serious nephritis so that he wondered whether or not we did not do more harm than good in eclampsia, or renal insufficiency, by using large quantities of salt solution.

With regard to vaginal Cesarean section, he did not intend to convey the impression that it should be used in all cases, but in those cases where the cervix either could not be dilated, or was not in a condition to be dilated. In the case he reported instrumental dilatation was tried for ten minutes, and no impression was made. Rather than go on for a longer time he did a vaginal Cesarean section and the child was delivered in ten minutes.

Dr. Barton Cooke Hirst read a paper on

THE MORTALITY OF OPERATIONS, OTHER THAN STRUMECTOMY, IN CASES OF EXOPHTHALMIC GOITER, WITH SPECIAL REFERENCE TO GYNECOLOGICAL OPERATIONS.*

The following officers were elected for the coming year: *President,* Dr. R. B. Maury, Memphis, Tenn.; *Vice-Presidents,* Drs. Howard A. Kelly, Baltimore, and Reuben Peterson, Ann Arbor, Mich.: *Secretary,* Dr. J. Riddle Goffe, New York; *Treasurer,* Dr. J. Montgomery Baldy, Philadelphia. Place of meeting, Hot Springs, Va., 1906.

TRANSACTIONS OF THE CHICAGO GYNECOLOGICAL SOCIETY.

Meeting of April 21, 1905.

The President, J. Clarence Webster, M.D., *in the Chair.*

Dr. Charles B. Reed reported two obstetrical cases.

CASE OF SPONTANEOUS EVOLUTION.

On April 5, 1905, Mrs. S., multipara, aged 29, entered my service at Cook County Hospital as an emergency case. The presentation was transverse, being scapula left anterior, right arm and cord prolapsed. No pulsation in cord. Bag of water had ruptured eight hours earlier.

The uterus was not in tetanus nor contracted down over the fetus; the pains were not especially severe.

The woman was in good condition, and preparations were begun for extraction when the pains became suddenly stronger, and under this increased activity the back was doubled up and forced into the vagina, the breech and legs were delivered, followed by the shoulder and head, thus constituting one of the relatively infrequent cases of spontaneous evolution.

The child was rather immature in appearance, but weighed 2,600 grams.

In relation to this case it is interesting to note that 287 cases have been reported in the last century (Payer), including over ten living children.

The rarity of these cases varies remarkably, for in 202,426 labors, Burns of Glasgow saw only two instances; Riecker saw ten cases in 220,000 labors, while Kleinwächter saw five in 3,345.

Jungmann has ordained as absolutely requisite for the phenom-

*See original article, page 367.

enon that the os should be completely dilated, the pains powerful, and the pelvis roomy, while as favoring factors he recognizes immaturity, maceration, and prolapse of an arm.

The pelvis in this case was of average size only, the spines measuring 25 cm., the crests 27 cm., Baudelocque 21 cm., and diagonal conjugate 12 cm. In this connection Grossmann's case (1895) is interesting, inasmuch as he reports a child of 3,700 grams passing a pelvis with a true conjugate of 9.75 cm.

Kleinwächter also reports a pelvis of 8.8 cm. true conjugate, measured on the corpse, though a child weighing 2,730 grams passed.

Champion (1835) reports a case where the child weighed 3,270 grams and lived.

Payer reports 28 cases where the child was said to be mature, and of six that were born living no weight was given.

The dorso-anterior position which prevails among transverse presentations in a ratio of six to one, maintains its prominence in these cases also, spontaneous evolution, with back posterior, being reported only seven times. According to all observers the process takes very little time when once inaugurated, one or two pains being sufficient to complete the expulsion.

Payer expresses regret that so little attention has been paid to the length of the child in the various reports, as he claims, with apparent justice, that it is more important than the weight.

RUPTURE OF VAGINAL VAULT.

On April 4, 1905, Dr. Swan, of the County Infirmary, asked me to see a case of transverse presentation.

The patient, 30 years old, III para, began to have pains about 7 o'clock A. M. April 3, and at 11 o'clock P. M. the bag of waters ruptured spontaneously, and the right hand and cord came down.

At 5.30 A. M., April 4, no progress being observed, Dr. Swan was called, and he advised removal to the County Infirmary for appropriate attention. At 6.30 A. M. I found the case as described, and having put the laparotomy set on to boil, the patient was anesthetized. In making the vaginal examination my hand passed along the prolapsed parts, which seemed unusually mobile, and easily entered the uterus, which was well contracted. No contraction ring present. The child was quite movable.

Withdrawing the hand slightly, I found a tear in the anterior uterine wall, extending from the cervix well into the lower uterine segment, and my hand slipped easily over the anterior surface of the uterus into the abdominal cavity. The peritoneum was torn across from broad ligament to broad ligament, high up on the anterior uterine wall, and the posterior wall of the bladder presented a longitudinal rent about two inches long.

As the hand was withdrawn I caught the anterior foot of the child and did an easy version and extraction. The hemorrhage was slight.

After scrubbing the abdomen it was opened in the median line and found full of clots. The uterus was rapidly stripped of its peritoneum posteriorly; the blood vessels were tied. The anterior wall was entirely free. After removal of the uterus the peritoneum was sutured, the rent repaired and abdomen closed without drainage. The patient died the tenth day after the operation, of acute pneumonia. One is very curious to know why this tear in the vaginal vault occurred.

There was no instrumentation or traumatism, the pelvis was not contracted, the child was not abnormal.

The transverse presentation cannot be solely responsible for the majority of uterine ruptures, and fornix tears take place when the child lies in a longitudinal or at least an oblique direction.

Thus Stschotkin reports 66 cases of tear of the vaginal vault in only 10 of which (15 per cent.) the child was transverse.

Kaufmann records 75 cases, of which 30 (40 per cent.) were transverse, and Koblauck reports 80 cases of uterine rupture with only 7 which were spontaneous and the child transverse. Freund is convinced that the tear occurs in consequence of the restraint of motion in the lower part of the genital canal, which he explains as follows:

If the head and cervix are driven down together into the pelvis and wedged there the continuance of uterine contractions gradually thins out the lower uterine segment, until finally rupture occurs, the cervix being held down so that it cannot follow the fundus in upward contraction. On this ground he explains those ruptures which occur when the head is deep in the pelvis or has even passed the vulva, the shoulders or body of the child acting as a means of fixation of the cervix. This tear of the lower uterine segment, he claims, is almost peculiar to the oblique presentations of the fetus.

On the other hand, when the presenting part does not enter the inlet as in transverse presentations, contracted pelvis or pendulous abdomen, the vagina being firmly attached to its underlying fascia does not draw up in response to the uterine contractions, and when the intervening tissue becomes overstretched it finally yields and the tear takes place in the vaginal vault, and twice as often in the posterior fornix as in the anterior, owing to the greater support which the anterior wall receives. To my mind this theory is not entirely satisfactory.

Dr. Rudolph W. Holmes.—Now and then we meet with cases of perforation of the cervix from compression of the structure between the head and pelvic bones. Some four years ago it was my misfortune to be present at a case where the cervix was exceedingly rigid, due to a scar which included nearly the right half of the cervix. On examining the pelvis I discovered it to be slightly generally contracted, the linea pectinata being easily palpable, with a distinct ledge projecting from it fully an eighth of an inch. The first labor, nine years before, was tedious, and was terminated with forceps; an infection resulted. Unquestionably

the scar was due to this projection of the linea pectinata cutting the cervix. The relation of Kilian's Steckelbecken (thorn pelvis) to these cuts in labor have not been sufficiently emphasized. It seems to me that Dr. Reed's case was more of the nature of a rupture of the uterus at the vaginal junction than a rupture of the vaginal vault itself. She was a multipara, therefore she probably had disturbance at some previous puerperium which caused a pathologic condition of the lower segment. About a year ago a case was reported to this society in which mutilation due to forceps, and the subsequent infection, had so injuriously affected the uterus that in the second labor rupture of the uterus occurred within half an hour after labor had started. Injuries to the lower uterine segment and infection play an important part in the causation of ruptures in a subsequent labor.

Dr. Mark T. Goldstine reported a case of

COMPLETE RUPTURE OF THE UTERUS.

Mrs. L. aged 39, VI. para. Previous labors had been normal. Present pregnancy at term. Labor pains commenced at 10.30, April 15. Waters came away at 12.30 A. M., April 16. Pains very severe until between 4 and 5 A. M., April 16, when they suddenly stopped and patient fainted and felt very ill. Saw patient first at 8.30 A. M., April 16. She showed all symptoms of severe shock. Pulse 140 to 150, weak. Temperature 98. Covered with cold sweat, etc. Patient was flowing very little and had not lost very much blood externally. The arm was prolapsed and hand protruding from vulva. Abdomen not overdistended and contents easily felt. Uterus well over to left side and firmly contracted, on a level with the umbilicus; child was lying on right side, head in right iliac fossa, back to abdomen of mother, breech in upper part of abdomen. No sounds audible. Had patient removed to Samaritan Hospital and operation started by 10.30 A. M. The abdomen was opened. The placenta was lying directly under incision in free peritoneal cavity and the child below it entirely out of the uterus, with exception of the prolapsed arm. The rent extended from the uterus into the vagina about two inches. There was not more blood in the uterine cavity than after a normal pregnancy, with the placenta separating after the Duncan method. The hysterectomy was difficult, yet almost bloodless. Usual technique after such cases was followed. The patient is making a very satisfactory and rapid recovery. Her temperature has been between 99½ and normal since Tuesday evening after operation, and pulse below 100. Child weighed 8 pounds, 4 ounces. Development normal. Patient was attended by midwife.

ECLAMPSIA.

Dr. Charles S. Bacon.—I wish to report a case of eclampsia which differs from others in the nature of the convulsions.

The patient was first seen by Dr. Fowler about 2 o'clock yes-

terday afternoon. The woman had then had two or three convulsions. The attack which he saw was peculiar in that the convulsions lasted unusually long, two or three minutes, and were not succeeded by the usual relaxation and stupor. She was having very frequent convulsions, or rather a condition that seemed like a tonic or continued convulsion. She was taken to the hospital, and while there was in this peculiar condition, differing quite markedly from any of the eclamptic convulsions I have ever seen. I saw her only a few moments before the operation. She was practically moribund at the time. She had a temperature of 104½° when first seen by Dr. Fowler. The uterus was not open. The patient was a multipara, had had a number of children, and had a very severe perineal laceration extending through the sphincter ani. The cervix was very dense, and with a good deal of difficulty admitted one finger. The anterior and posterior uterine walls were opened and a child about 47 centimeters long was extracted. The child was rather deeply asphyxiated, but was resuscitated. The patient lived only a short time after the operation. A post-mortem examination by Dr. William A. Evans was negative so far as finding any other cause than eclampsia. The usual lesions of the heart, liver, and kidneys were found, but none of the brain.

Dr. J. V. Fowler.—There is one point which Dr. Bacon overlooked in citing this case, and that is, this woman was an old syphilitic. I obtained this information from her brother, also I was informed that she had had a very intense headache for about a week. From his description, I should say it was more intense than patients usually have during the premonitory symptoms of eclampsia. These two facts, coupled with that of the continuous clonic spasm, led us to suspect a brain lesion.

Dr. Joseph B. De Lee.—Dr. Lewis stated that his patient had albuminuria and delirium tremens. I recall one case I had of toxemia in pregnancy that presented a perfect clinical picture of delirium tremens of the low asthenic type, in which I induced labor on account of the toxemia and delivered a live child, but the woman died twenty-six hours afterwards. Is it not possible that Dr. Lewis' case was one of toxemia presenting the picture of delirium tremens?

PLACENTA PREVIA.

Dr. Henry Banga.—I will report a case of placenta previa which, I think, presents some interesting features. On the 10th of October, 1904, I was called to see a woman who was suddenly taken with profuse hemorrhage from the vagina. She was then approaching the end of the seventh month of pregnancy, expecting to be confined in the middle of December. She was a IV.-para. On examination I noticed vigorous uterine contractions. The patient said she had felt them for weeks by placing her hand on the abdomen. She was sure, though, they were not labor pains. This statement was apparently borne out by the find-

ings of an examination per vaginam: The uterine contractions had made no impression on the cervix. It was rather long, as open to the finger as one would expect in a IV.-para. I could reach on the left side of the inner os what I considered to be the somewhat loosened border of the placenta. The whole uterine segment was distinctly cone-shaped, the left half of it being much fuller (containing the placenta). There was no presenting part to be touched within the pelvis. The general condition of the patient was good; pulse 86. She did not bleed any more, except some slight oozing. There was nothing to account for the unexpected bleeding. The general and local conditions had been normal so far during this fourth pregnancy. The diagnosis was, of course, placenta previa marginalis, partially detached. No labor pains.

I decided to stay at the patient's house for the night, and to wait for further developments. Nothing happened, however, although those vigorous uterine contractions kept on recurring every half to one hour. It was then decided, in order to prevent, if possible, a recurrence of the hemorrhage, to keep the patient in bed. After four weeks, during which time no trace of bleeding had been noticed, I allowed the patient to get up, and after a few days to take a walk. A slight hemorrhage caused her at once to return to bed, determined to wait there, if possible, for the normal end of her pregnancy.

About two weeks before the expected term, one morning I was called in great haste to the patient's house, the waters having broken. I found that she had no labor pains, and had not bled. Those uterine contractions were very much in evidence, but the patient insisted they were not of the right kind.

On vaginal examination I found hardly any dilatation, but I could feel a foot; membranes ruptured, the water apparently drained off. Gradually, towards noon, regular labor pains began to develop, and at 5 P. M. the child was born naturally; I just had to lift the head over the perineum. The placenta soon followed the child. An area of its surface of about the width of one-half of the palm of the hand, presented that whitish, glistening, silky appearance peculiar to so-called fibrinous organization of a bloody surface; it was the detached part which in the seventh month had caused the hemorrhage. The membranes were exceedingly delicate and thin, and ruptured close to the edge of the placenta.

This case seems to me of interest, because it clearly demonstrates the correctness of Budin's explanation of the cause of the hemorrhage in placenta previa, to wit: Before rupture of the bag of waters labor forces the *entire ovum* with its lower pole into the os, the ovum acting as a wedge, gradually dilating the os. We may also put it this way: While contracting, the uterus strips itself off in an upward direction from the ovum. The placenta, being an integral part of the ovum, will, during this stage of labor, go with the unruptured ovum. Hence the placenta, being inserted somewhere near the inner os, or at least at the lower uterine segment which is subjected to gradual dilatation from the

beginning of labor, will be stripped off from this section of the uterus, causing bleeding. As soon as the membranes rupture and collapse, the placenta, as far as the mechanism of birth is concerned, does not belong to the ovum any more, but becomes part of the uterus to which it adheres. There is no more pulling on the placenta by the tight membranes as before rupture, hence no further detachment of placenta, and no more bleeding.

The rupture of the membranes has always been considered of great help in cases of placenta previa. However, it was claimed its usefulness consisted in allowing the descent of the fetus, which then acted as a kind of a tampon, pressing against the placenta and the uterine wall. I am satisfied, though, that Budin's explanation, as given here, is the correct one, and should be used as a guide by the obstetrician in managing such cases.

In my case labor was ushered in by the rupture of the membranes. This early rupture was, no doubt, caused by the foot presentation and by the unusually delicate structure of the membranes. While labor proceeded and the os gradually dilated, not a drop of blood was lost, because the early rupture of the membranes prevented pulling on and further detachment of the placenta.

Dr. Gustave Kolischer.—It is very hard to explain nonbleeding in cases of placenta previa on theoretical grounds. If the theory which Dr. Banga has suggested should prove to be right, it would be impossible in a case of placenta previa for the woman to bleed during pregnancy, yet it is a very common occurrence. One of the phenomena which first call our attention to the fact that we may have to deal with placenta previa is that the woman bleeds more or less all the time, or very often, during pregnancy, when certainly the membranes are not ruptured. It is hard to conceive how we consider the placenta a part of the ovum, in the sense of Dr. Banga. Many experienced obstetricians, especially the French, occasionally will watch a case of placenta previa marginalis, and attempt, by successful detachment of the placenta, to get a living child. That bleeding in a case of placenta previa does not stop after the membranes are ruptured is a common experience. In most cases of placenta previa we have to interfere when the bag of waters has ruptured, in order to check the hemorrhage. It is undoubtedly true that we check this hemorrhage if we bring down a part of the child, whether it be the head or the leg. This compression entirely stops the hemorrhage for the time being. If we have made a diagnosis of placenta previa, and there is delay in dilating the cervix, there is but one thing to do, and that is to insert the colpeurynter, in order that contractions of the uterus may occur. If there is a slight deviation of the skull of the fetus, there may be excessive pains, still the head does not come down. This does not, however, prove that labor is not in progress, and we are never in a position to say that a case of placenta previa will not lead immediately to a hemorrhage which may terminate the life of both the child and the mother. If the

membranes are ruptured and pains are present, we substitute the action of the amniotic sac by the colpeurynter, which will be pressed down by the pains. We may attach a weight to the bag in order to check hemorrhage and to dilate the cervix at the same time.

Dr. Rudolph W. Holmes.—A time-honored method of treating placenta previa is the rupture of the membranes—a method introduced by Puzos. In Rigby's paper on the treatment of antepartum hemorrhages, one of the most momentous monographs on this subject, we find that he held to the precept of rupturing the membranes in his so-called accidental hemorrhages (ablatio placentæ—premature detachment of the normally situated placenta) with very happy results; he deemed the same procedure was of little or no avail in placenta previa. In my paper on ablatio placentæ I contended that Rigby had too many premature detachments in proportion to his placenta previas, that is, many of his cases of accidental hemorrhage were merely lateral previas; the many successes in rupturing the membranes were due to the fact that the early draining of the amniotic sac permitted the presenting part to press upon the bleeding area in the lower segment, and also that the mechanism described by Budin was brought about. I am firmly convinced that the timely rupture of the membranes is of signal benefit in treating certain lateral placenta previas: I would demand as conditions for this procedure the following: A breech or a normal cephalic presentation, labor actually started, the hemorrhage moderate, and no circumstance immediately or remotely indicating active intervention in the way of delivery. I would strongly deprecate the rupture of the membranes to initiate labor in lateral previas—in fact, I consider the method an obsolete means for the induction of labor for any indication. In Dr. Banga's case the premature rupture of the membranes happily produced the same effect as we hope for in the lesser grades of previa. Another point—sometimes the evacuation of the amniotic sac does not stop the hemorrhage; therefore the colpeurynter should be at hand in the event that the method fails.

Dr. Charles S. Bacon.—The occurrence of uterine contractions during pregnancy is very common—in fact, almost universal, I might say, and it is also very rare for the woman to feel the contractions. During labor, uterine contractions may cause opening of the uterus without their being felt by the patient. Numerous women have passed through a short labor with only a few pains and felt only expulsive contractions. Theoretically, it is a physiological condition when the pains are no more felt than the contractions of other organs, as the heart, the intestines, etc. I had supposed that it was almost universally acknowledged that these contractions during pregnancy are one cause of the bleeding in cases of placenta previa; that the contractions tend to a certain extent to pull the lower uterine segment away from the placenta, just as they do when the bleeding occurs after labor has begun.

I do not quite understand Dr. Kolischer's contention. The fact that the membranes ruptured early and prevented a hemorrhage is exactly as Dr. Banga described.

It was very fortunate, as Dr. Banga says, the membranes were thin, and they ruptured early, because they probably prevented a hemorrhage from taking place. Is it a safe rule to leave a case of this kind to nature, trusting to thin membranes and early rupture?

Dr. Gustave Kolischer.—Does Dr. Bacon mean to say that it is impossible for a case of placenta previa to bleed during pregnancy without contraction of the uterus?

Dr. Bacon.—I think it would be difficult to say that there were no contractions of the uterus in case of bleeding.

Dr. Kolischer.—That means a placenta previa case cannot bleed as long as the cervix is not effaced; that it bleeds only because uterine contractions lead to stretching of the cervix, so that the placenta thus becomes detached. If that is right, then we should have hemorrhage from a placenta previa without changes in the lower uterine segment, which certainly is not the case. We can find any number of cases of placenta previa that bleed constantly during pregnancy, and when it comes to the final issue, there is considerable difficulty in performing version on account of the condition of the cervix, and that is why Braxton-Hicks devised his method of performing version with two fingers.

Dr. Charles S. Bacon.—The changes that take place in the last month or two of pregnancy in the lower uterine segment are well-known. Since the effacement of the cervix is not a very rapid process, I can hardly say that there will be any hemorrhage without some effacement of the cervix. There are certain changes that begin long before the cervix is obliterated that are sufficient to cause a separation between the placenta and the lower part of the uterus.

Dr. J. Clarence Webster.—In considering hemorrhages in placenta previa we must not forget that a reflexal placenta may be a cause. If you bear in mind that, normally, after the first four months, the reflexa gradually degenerates and disappears, though with great variations, it is not wonderful that a well-developed chorion attached to that reflexa, without any organic union of the latter with the uterine wall, is liable to rupture. It is certain that in some cases the hemorrhage is associated, first, with degeneration of the reflexa, to which the villi are attached; second, to the phagocytic action of the fetal epithelium eating into the decidual tissue and into the sinuses which are in the reflexa, corresponding to those in the serotinal portion of the decidua. May we not in some of these cases look for some mechanical alterations in the relationship of the uterine wall of the cervix and placenta to explain the hemorrhage? We know that reflexal placenta is probably an important cause of abortion, but not generally recognized, because the ovum is not carefully examined.

Dr. Banga (closing).—Just one word as to the toughness of the membranes. It is impossible to recognize it before labor is in

progress. In rupturing the bag we should not merely prick the membranes, but should make sure of a wide tear so as to exclude all further traction by the membranes on the placenta. This is especially of importance where the amniotic fluid is scant and the act of rupturing is difficult.

CORRECTION OF A MENTO-LEFT-ANTERIOR BY ZIEGENSPECK'S METHOD.

Dr. Rudolph W. Holmes.—A year ago last February I was called by Dr. J. C. Williams to see Mrs. W., who was in labor for the first time. She had been in labor for some twenty-four hours; the membranes had been ruptured about four hours. Uterine contractions had been strong, the uterus was firmly contracted upon the child. The fetal heart tones were distinctly heard; the child was considered to be a large one, about ten pounds. A caput was fully developed, which precluded an estimation of the vera; the findings gave the impression of a generally contracted pelvis; at a subsequent period the conjugata vera was found to be about 9½ centimeters. The difficulty in the labor was due more to the disproportion between a large hard head and the pelvis than to actual pelvic contraction. The extraction was rather difficult with the Felsenreich forceps. Finally a dead child, weighing 11 pounds, was delivered. The woman again became pregnant, and fell into labor March 24, at midnight. Pains soon became strong, and Dr. Williams was summoned; he found the os partially dilated, membranes intact, and the face presenting in a mento-left-anterior position. I was at once notified, and suggested that she be taken to a hospital where the operative work could be carried on more safely and conveniently. The woman was taken to the Passavant Hospital in an ambulance, where I saw her for the first time. There I was able to corroborate Dr. Williams' findings. The membranes were still intact, the os had become fully dilated, the mento-frontal line still being high. She was admitted at 2.30 and anesthesia was begun at 3 A. M. I corrected the face presentation by the method of Ziegenspeck, which, in the case of a left mento position, consists in introducing the right hand into the vagina, pushing up the chin and the malar processes, while, with a synchronous movement, the external hand pushes the occiput down; meanwhile an assistant carries out the maneuver of Schatz. The technique was easily carried out. As sometimes happens in the correction of a face presentation, there was a tendency for the occiput to rotate posteriorly, so a manual rotation of the head was undertaken; this was consummated only when the shoulders also were rotated. The woman was allowed to come out of the anesthetic, and in about ten minutes strong pains recurred, and the child was spontaneously expelled within another ten minutes. The child weighed 8½ pounds.

DYSTOCIA DUE TO VENTROFIXATION.

Five years ago the patient was operated on for retro-

version of the uterus and prolapse of the ovaries. She is now 27 years old. The woman was married in February, 1903, and in due time became pregnant. Labor was due April 9. She is of a highly strung disposition, perhaps inclined somewhat to hysteria. On the 12th of April labor began; pains were infrequent and not strong, although she made much ado about them. I saw her when labor had continued about eighteen hours. The examination of the abdomen showed a scar in the midline, about three inches long, half way between pubes and umbilicus. At the upper angle of the scar one could feel a distinct band, which stood out prominently during each contraction; this band was, perhaps, as large as the little finger. The uterus was accurate, the larger prominence being on the left side. The uterus was firmly contracted, making the external examination somewhat difficult, especially as the patient was a large woman. The contour of the uterus suggested one containing a child in the transverse position. The resistance over the pubes convinced us a head was there, and that we were dealing with an occiput right posterior with marked obliquity of the uterus; unquestionably the breech was in the left horn of the uterus. Internally we found the cervix was practically unaffected by the labor; the os did not admit one finger. A head was palpated with difficulty.

An anesthetic was given; the os was dilated with Hegar's sounds, and then a Voorhees bag was placed within the uterus. Within two hours this bag was expelled. When the hand was introduced for the version an interesting compound presentation was discovered; the head was found resting on the right linea pectinata in a R. O. P. position with a shoulder near the brim, making the position almost a head-shoulder presentation. The membranes had been ruptured for some hours. It was one of the most difficult versions I have had to undertake. Finally the turning was consummated. By the time the shoulders were delivered, my hands were so cramped that the assistant had to deliver the head. The baby was deeply asphyxiated; after working over it for some fifteen minutes it was resuscitated.

I report this case for the purpose of condemning ventrofixation, or even ventrosuspension in a woman who has the potential prospect of bearing a child. After the menopause it is another matter entirely. Ventrosuspension is nearly as bad as the fixation, for the result in either is uncertain. The technique of ventrosuspension may be carried out and a certain amount of inflammatory reaction be produced with a subsequent fixation; on the other hand, fixation may be done, but the bands may be insufficiently strong and stretch, so we ultimately have a suspension. Fortunately this is not of such danger as the former contingency.

FIBROIDS COMPLICATING PREGNANCY; MYOMECTOMY.

Dr. J. Clarence Webster.—The patient, a Russian, aged 31, had been married ten years. She was admitted to the Presbyterian Hospital on April 2, on account of hemorrhage from the uterus.

Six and a half months previously she had given birth to a child, the labor having been normal. She had been bleeding for twelve days previous to her admission. The condition on examination was as follows: Behind the symphysis, and extending to the right, there was a firm swelling a little over four inches in diameter. The cervix could not be felt with the fingers; it was pushed away up behind the swelling; and posterior to the firm mass there was a larger mass, which had the characteristics of a pregnant uterus. The mass could not be moved; it appeared to be more or less fixed. The diagnosis was fibroids and pregnancy. The condition was such that I felt the uterus should certainly be emptied. It was impossible to carry out any manipulations per vaginam, and, therefore, I decided to perform abdominal section. On opening the abdomen I found a large fibroid developing from the cervix, extending extraperitoneally in close relationship to the bladder into the right broad ligament. There were three or four very small fibroids besides this one, in the wall of the uterus. I first performed myomectomy, removing the large tumor, leaving a broad raw area on the anterior wall. I then decided to empty the uterus, and made a mesial incision in the uterus through the myomectomy wound. There was an accumulation of black clot, a reflexal placenta, and a fetus four and a half months old, slightly macerated. I removed the entire contents of the uterus through the incision. The latter and the raw area were then closed by means of catgut sutures in several layers. Before carrying out closure I passed an ordinary Sims dilator into the uterus, in order to dilate the cervix, so as to place a piece of gauze in it for drainage. The patient made a satisfactory recovery.

I am not aware of the record of any similar case, and it is interesting from the point of view of the technique. It is also extremely interesting from the point of view of the pathogenesis in the case. The woman had had five labors that were normal. She had had a labor that was normal at six and a half or seven months previous to her admission to the hospital. She had not menstruated since, and had nursed her baby for three months. What was the condition of the fibroid at her previous labor? It is scarcely possible it was present in such a fixed condition as was found at operation without having caused trouble in the last labor, and the probability is that rapid increase in size had taken place.

Dr. Karl F. M. Sandberg read a paper entitled

ALEXANDER'S OPERATION THROUGH THE MEDIAN INCISION.

Dr. Alexander Hugh Ferguson.—The Alexander operation in any shape or form I have not done now for several years, finding it absolutely unreliable. First of all, the name given by the author of the paper is hardly a proper one—"Alexander's Operation Through a Median Incision." An Alexander operation, in order to be such, must not have a median incision; it must have lateral, inguinal incisions. The round ligament must be taken

* See original article, page 411.

up in that region and shortened, and the technique of the Alexander operation must be followed in every detail, otherwise it is not Alexander's operation. I doubt the wisdom of tunneling underneath the skin and two layers of superficial fascia and fat between them, from the median line away over to the external ring. When the abdomen is opened there is much less traumatism attending anterior transplantation of the round ligaments forwards, or passing the round ligaments behind the uterus, as has been advised by Dr. Webster. I nearly always do anterior transplantation of the round ligaments. It has the advantage that the uterus cannot go back afterwards. The uterus is brought forwards, by the two round ligaments, through the rectus muscles three-quarters of an inch from the median line on each side, three-quarters of an inch away from the pubic bone. No adhesions can take place. The uterus is left perfectly free to swing by its round ligaments and a portion of the broad ligaments. It does not interfere with pregnancy. You have the abdomen open in the median line and can deal with any and all pathological conditions.

Dr. Franklin H. Martin.—This operation is a new one. I have searched the literature very thoroughly in the last year or two on this subject and I found nothing similar. It commends itself to me very strongly on first thought as a round ligament operation. First, because it shortens the round ligaments in the direction of their insertion and through the canal, and utilizes the strongest portion of the round ligaments for the work of support; second, because it enables one, through one incision, if it is necessary, to open the peritoneum and do repair work at the same time. Accomplishing these two things, it seems to me to be an eminently superior operation to any form of suspension or fixation operation, or any form of intraabdominal shortening of the round ligaments. The operation that would compete with it it the Beck-Ferguson-Gilliam operation, that has already been described by Dr. Ferguson. That operation shortens the round ligaments and utilizes the strongest portion, but by no means in the direction of their natural insertion. The operation of shortening the round ligaments by parietal inclusion, the Beck-Ferguson-Gilliam operation does so by inserting the ligaments very much higher than the normal position, and in an entirely erroneous direction. It literally lifts the uterus up and forces the front of the fundus to the abdominal wall, and by doing that, it of necessity tilts the cervix forward. If there is anything that will determine the continuance of retroversion, it is that which tends to throw the cervix forward, put the sacrouterine ligaments on the stretch, and change the direction of the axis of the uterus so that it lies parallel with the axis of the vagina. It is impossible to get prolapse without, at the same time, getting a certain amount of telescoping in the vagina. If you keep the uterus at right angles with the vagina forward, it is impossible to get a retroversion.

Dr. A. Goldspohn.—A commendable feature, on general principles, of the procedure that Dr. Sandberg has outlined is, as Dr.

Martin stated, that it deals with real ligaments, not manufactured or imaginary bands—real ligaments that are a part of the uterus; a part that undergoes evolution and involution with the uterus. I do not think the name given by Dr. Sandberg is appropriate, for the reasons stated by Dr. Ferguson. Permanent results will hardly be obtained by this technique, because it is not possible to treat the round ligaments as thoroughly and attach them as firmly as through an incision directly over them. Thorough shortening of the round ligaments bi-inguinally, leaving aside the technique of Alexander as a superseded affair, means either a thorough union of the ligaments in the shape of a knot, or, what I consider better, fixation of the thick part of the ligament of Poupart's ligament posteriorly. Such fixations are not possible by the operation described by Dr. Sandberg. Better than that, I think, is the operation on the plan of Beck, Ferguson and Gilliam, with such modifications as almost any operator of experience will make.

I cannot quite agree with Dr. Martin's view as to the evil of round ligament suspension of the uterus from obliteration of the normal angle between the long axis of the vagina and that of the uterus. I have done this suspension of the uterus by the thick ends of the round ligaments drawn into stab wounds in the abdominal wall in a large number of cases. The primary effect is very good. The only question with reference to this procedure that must yet be solved, and which has been solved very fully so far as the bi-inguinal shortening of the round ligaments is concerned, and by that operation alone, is, Are the ligaments going to undergo involution after labor and thus prevent return of retroversion, as we know they do when they have been shortened bi-inguinally? In the latter case they do not carry the weight of the uterus. In the former case they do, after parturition; and these are two vastly different propositions for these ligaments to contend with. That they should become involuted and hold the uterus anteverted when they do not carry its weight, as after inguinal shortening, is natural, and experience has shown that with repeated labors the ligaments so shortened become even more intensely shortened; that is, anteversion becomes accentuated with repeated labors after thorough inguinal shortening of the round ligaments. But we need to see hundreds of women who have passed through labor after this round ligament suspension, where the ligament is drawn into stab wounds in the abdominal wall. Only a few cases have been observed, and these speak favorably for its results, but they are utterly insufficient to decide the question. If by larger observation it shall be developed that in the large majority of such cases the uteri have been found, after one or more labors, to remain in normal position, then the reasons for my more difficult, but anatomically more correct, procedure of shortening the ligaments bi-inguinally will be largely done away with. I may state here why I have accepted this procedure for some cases in which I formerly did bi-inguinal shortening only. First, a large number of cases need a median incision of the abdomen for clear reasons before we

begin. For instance, there may be a suspicious appendix, or diastasis of the linea alba due to frequent pregnancies. Secondly, I discovered, after years of observation, that the bad cases, the most extreme cases of adherent retroverted uteri, with closed tubes and cystic ovaries, the victims of previous severe pelvic peritonitis, that I formerly treated by my bi-inguinal method through the dilated inguinal canals and rings without cutting of any muscular structures, did not usually become pregnant after partial removal and reconstruction of their remaining portions of adnexa. It is to maintain the capability of pregnancy and to retain the uterus permanently in normal position after labor that I have developed my operation. Therefore, seeing that these women did not become pregnant, except in a small number of cases, I have rather ceased doing this procedure in those bad cases. I, therefore, resort to a median incision, as others have done, and suspend the uterus by drawing the thick ends of the round ligaments into stab wounds that are made on each side of the median incision.

Dr. Charles S. Bacon.—I would like to ask Dr. Sandberg whether he simply dissects to the external ring, or whether he carries the dissection up over the inguinal canal, and how much difficulty he encounters in drawing out the ligament by this method. Then, too, I would like to ask him as to the number of cases he has had.

Dr. Gustav Kolischer.—Most of the operations for retroversion or retroflexion to a certain extent will be sooner or later abandoned.

I endorse Dr. Ferguson's contention that, theoretically, if we get away from the principles of the Alexander operation, we cannot call the operation by the name of Alexander. Furthermore, it is impossible to judge the merits of the operation if we simply apply the operation to this and that case, or a large number of cases, without reporting exact statistics. Dr. Goldspohn, for instance, always demands his double test of pregnancy in criticizing such operations. But I would like to say this most emphatically, that if a uterus is retroverted and some one feels called upon to anchor it in some new way, he should do it, but should not publish it.

Dr. Sandberg (closing).—In regard to the name not being correct, as stated by Drs. Ferguson and Kolischer, I still think it should be retained just as it is. The principle of the Alexander operation is to regain the normal attachment of the fundus of the uterus anteriorly by pulling the overstretched round ligaments out through the inguinal canals, taking up the slack externally and securing the balance in a normal position. Whether you reach the inguinal canal through two direct incisions or through one indirect one does not alter the principle in the least. In regard to the difficulty of the operation, that seems to have been overestimated by some. The operation is easy. There is no long tunneling, no long dissection; it consists simply of a blunt tearing loose of the skin and adipose tissue from the fascia; this is done in one minute. I use the old Langenbeck dissector. Holding the flap to the side

with two retractors, the external inguinal ring, as well as the lower part of the inguinal canal, is exposed as in the ordinary Alexander operation. The ligaments are no more difficult to find than they are by the straight incision.

I have not had time to look up the number of cases in which I have done this operation; but I should say, speaking from memory, that they are between fifty and seventy-five, and as I stated in the paper, so far as I know, there has been but one failure, and that was not a complete one.

This modification of the Alexander operation suggested itself to me for the following reasons: After performing an Alexander operation I often left the patient with doubt as to the final result, realizing that there might be intraabdominal adhesions, which could not be recognized by external examination and that while they would not prevent me from placing the fundus forward, still would exert a constant traction upon it and gradually pull it back into its former position, making the operation a failure. By opening the abdomen I could guard myself against failure from these causes, as well as against those from prolapse, enlarged ovaries, or from other complications that may remain even with the position corrected. I felt that if I should perform the Alexander operation through a bi-inguinal incision, and then open the abdomen through a median one, the patient would receive the impression that there was some sort of bungling work done. Three incisions would, I thought, impress the patient as a little too much, and if the operator could accomplish through one incision as much as through three of them, he undoubtedly would please his patients better.

Then, again, in case of operations on the uterus and appendages, the uterus is often in need of anterior support.

Dr. Gustav Kolischer read a paper entitled,

SEXUAL FRIGITY IN WOMEN.*

Dr. Charles B. Reed.—This is a very important subject. I was very much impressed by the first cause enunciated by Dr. Kolischer, in the fact that it seemed at variance with our physiology. We are generally informed that the seat of sensation lies in the clitoris, and on that ground it would be relatively difficult to explain the absence of sexual sensation on account of the loss of tissue in the posterior part of the introitus. The doctor did not make quite clear how restoration of the torn perineum corrected the condition, but doubtless the crowding of the male organ forward in sexual intercourse caused the clitoris to receive the proper amount of titillation.

Dr. J. Clarence Webster.—I am sure we feel just as Dr. Kolischer has stated in his original remarks, that there is a tendency on the part of all of us to avoid a discussion of this subject, as being unsavory, but there is no doubt that it is one of the most important subjects that concerns society. We all know perfectly well that this very condition of sexual frigidity is an important

* See original article, page 414.

cause of marital unfaithfulness, and every now and then cases occur in which there is some definite pathological lesion, the removal of which will lead to restoration of a function which is perfectly natural and evidently necessary.

Dr. Frederick Leusman.—I would like to find out where the seat of orgasm in the female resides. In the male, genitourinary men have observed that the seat of orgasm resides probably in the prostate gland. I have myself removed the uterus of a woman 60 years of age, and she told me since that she enjoys sexual intercourse as well as she ever did. We all have removed ovaries, doing no other operation, and still the patients have enjoyed sexual intercourse afterwards, so that we must conclude that the ovary or ovaries are not an essential part. The uterus, too, can be removed, with no more effect. We have been told by Dr. Kolischer to-night that the clitoris has been removed, and still the woman enjoys orgasm. Now, if we can remove the uterus and ovaries, as well as the clitoris, and still the woman enjoys sexual orgasm, where is its seat. If we want to cure sexual frigidity it is important to know what are the essential parts to retain.

Dr. Kolischer (closing).—In reply to Dr. Reed, I will say it is very hard to explain the reestablishment of sexual function. If the perineum is torn and sexual orgasm is lost, and when the perineum is restored orgasm reappears, his suggestion would at first seem correct. I hesitated to accept such an explanation from the start, because we know of cases in which, after extirpation of the clitoris, excessive sensualism is not prevented.

Dr. Leusman confounds the place of the original excitation with the place where these things are conceived. In the first place, we do not know much about the actual seat of sexual orgasm either in the male or female. The theory advanced by Feleky is that the seat of orgasm in the male is the prostate and its adnexa. That may be true or not. It does not prove anything else than that a certain excitation is carried to the nerve centers. Some authors claim that sexual sensitiveness may be located in the cervix; by others it is claimed to reside elsewhere. We do not know how sensations are perceived by central organs. That one woman loses the uterus, or another loses the clitoris, without loss of sexual sensations, does not prove that these organs could not be their seat. We cannot say why, under certain conditions, a man does not get an erection in a case of gonorrhea. As long as there is involvement of the prostate and posterior urethra, he may not have erections, although the prostate is not the center of erection. If the prostate is squeezed out, and the whole process treated, the erections return and the precocious ejaculations are properly retarded. Is the prostate, therefore, the nerve center which directs the ejaculation? Certainly not.

As to the remarks of Dr. Franklin Martin, I fail to see their pertinence. As to the length of this paper, I want to say to Dr. Martin that I do not believe in taking a few experiences, or a few facts, or a few thoughts and diluting them with a few gallons of

watery talk, so as to stretch them into a long-winded paper. The value of a paper depends upon its merits and not upon its length.

TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

Meeting of March 17, 1905.

DR. STONE reported

A SERIES OF 100 HYSTERECTOMIES FOR FIBROMYOMATA OF THE UTERUS SINCE DISCONTINUING THE USE OF SILK SUTURES.

In these operations the adnexa were removed with the uterus, as a rule, although in some instances in comparatively young women, one of the ovaries, if perfectly healthy, was allowed to remain. The average weight of the uterine mass was 2½ to 5 pounds. Many would weigh 10 pounds, and one at least weighed 14. As a rule, the smallest tumors filled the pelvis, while the larger ones occupied the entire abdomen. Fully 20 per cent. had some complication, usually salpingitis or its results. Five tumors were retroperitoneal. None had caused dangerous pressure symptoms either upon the bowel, ureters, or bladder. The writer, therefore, doubted if these growths ever cause serious or fatal results by pressure. Nine tumors showed extensive cystic degeneration and ten had the same condition to a limited extent. Seventeen had intrauterine polypi or submucous myomata, which usually caused some form of suppuration about the stump or in the abdominal incision. In 1889 and 1900, eighteen operations were completed with the Tuffier angiotribe used upon the broad ligaments to secure hemostasis; all made excellent recoveries. Microscopic examination had not shown carcinoma associated with fibroma when the tumor was of large size. On the other hand, many carcinomatous uteri with small fibromatous nodules were seen, but there is no apparent pathological association. No patient had, in the reporter's experience, died of carcinoma after supravaginal hysterectomy for fibroid tumor. No changes in the sexual instinct had been reported. Two patients had large ovarian tumors removed along with the uterus and fibrous growth. One had a dermoid cyst of the ovary of small size. One had an infected tumor four weeks after miscarriage. No case of fat, or any other form of embolism, or pneumonia, or pleuritis, had occurred. One had a severe case of bronchitis after anesthesia. One had diabetes insipidus. One had cerebral hemorrhage, paralysis, and aphasia, and afterwards recovered. None had venous thrombosis. Cystic degeneration was frequently associated with profound anemia. Two patients were

saved by intravenous infusion of salt solution. One died of bowel obstruction, associated with fatty liver and atheromatous arteries; one, of asthenia about six weeks after operation.

Dr. J. T. Johnson read the essay of the evening,

POST-PARTUM HEMORRHAGE.*

Dr. Sothorn.—Post-partum hemorrhage is a subject which interests all physicians who do obstetrical work. As the essayist has said, it is frequently due to the bad management of the third stage of labor, but this is not always the case. Haste in expulsion of the placenta may cause it. Drawing upon the cord, hour glass contraction, and other circumstances favor it. The muscular wall of the uterus is thicker at the placental site and the hemorrhage usually takes place there. Tumors of the uterus favor its occurrence by preventing contraction. The effect of the loss of blood depends largely upon the condition of the patient, and remedial measures should be chosen with reference to this. If the patient is in a condition to stand a considerable loss of blood, it may not be necessary to do anything. In a case recently seen, the hemorrhage was apparently kept up by manipulation and the use of ice. There was considerable oozing, but the patient seemed in such good condition that the speaker advised that she be let alone, and the oozing soon ceased. To differentiate between hemorrhage from laceration and that due to uterine inertia one can depend largely upon the amount of uterine contraction. If the uterus is well contracted, look for a laceration. Where there is a sudden gush of blood, with systemic symptoms of hemorrhage and an uncontracted uterus, it means the usual post-partum hemorrhage. The essayist did not dwell upon the use of strychnine to combat post-partum hemorrhage. In two of the speaker's cases excellent results followed the hypodermic injection of large doses of strychnine, as much as 1/15 grain. One should always consider post-partum hemorrhage in the case of bleeders. The whole treatment in post-partum hemorrhage may be summed up by saying it depends upon promoting uterine contractions and favoring the formation of clots in the uterine sinuses.

Dr. White thought that the younger members of the profession did not, as a rule, realize what is meant by post-partum hemorrhage. They were inclined to call all cases with considerable oozing by this name. We were prone to take too much credit to ourselves in checking the hemorrhage. Nature does much, and, in the majority of the cases, the bleeding would cease if nothing was done to check it. Blood coagulates more promptly after hemorrhage, as shown in cases of severing of large vessels in attempted suicide, etc.

Dr. Fry believed that the essayist should not have placed hemorrhage from laceration in the class of post-partum hemorrhage. True post-partum hemorrhage meant hemorrhage due to

* See original article, page 407.

inertia of the uterus. The whole secret was to be prepared to deal with such a contingency. No one ought to accept the responsibility of attending an obstetrical case without going prepared to deal with this condition. In every case of confinement, the speaker had a sterile bag filled with boiled water, at a temperature of about 120° F., ready for the termination of the third stage of labor, and gauze tampons at hand. He has never had the tampon fail him but once. In a case at the Garfield Hospital, hot douches failed to check the hemorrhage and the uterus was tamponed. The hemorrhage continued, requiring the tamponade to be repeated several times. He finally packed the vagina and used a compress over the uterus, above and over the vulva. As a rule, he did not use very much gauze, just enough to stimulate uterine contractions. Ergot or ergotin focalized its effects upon the uterus and was preferable to strychnine, which exerted its influence on all the muscles. Formerly he regarded it as necessary to give ergot as a routine, but now he hardly ever used it, unless there was a tendency to hemorrhage. He would see that the uterus is contracted and knead it gently for a short time to favor this. He had seen a tendency to repeated post-partum hemorrhage without any definite cause in some cases. One woman in this city had had five hemorrhages in six labors. In this case he gave the hot douche even before the placenta was expelled.

Dr. Moran said that the proper management of the third stage of labor was to encourage retraction and contraction of the uterus. A common mistake was to attempt to force out the placenta too soon. When the placenta was expelled into the vagina, the uterus would rise in the pelvis, and this was the proper time to use the Credé method. The temperature of the douche was an important point. It should never be more than 120° F., and preferably about 115°F. The binder is useless to promote uterine contractions. After labor one should watch the patient carefully for some time. He seldom used ergot, because it was difficult to get a preparation which had not deteriorated. The douche and the tampon were the practical ways of combating post-partum hemorrhage.

Dr. Sprigg emphasized the fact that faradism stimulated uterine contractions. The only objection to it was its inconvenience. A battery was usually not at hand when its use was indicated. In a case where he used the Faradic battery, uterine contraction immediately occurred.

Dr. Fry said that a few years ago he looked up the causes of death after labor in the District of Columbia, and found hemorrhage to be the third on the list in point of frequency. He, too, formerly used the Faradic battery, but gave it up on account of the trouble in carrying it around.

Dr. Prentiss asked the value of suprarenal extract or adrenalin in these cases.

Dr. Fry said that he had used it in the water used in hypodermoclysis.

Dr. Bovée suggested compression of the aorta above the bifurcation to check the hemorrhage.

Dr. Adams said that for years he had no complications following labor, but he finally had a case where the hemorrhage came on after a considerable interval, and, on examination, a bladder-like structure was found filled with blood and protruding from the cervix. It was probably membranes which had not been removed, although the secundines had been examined and seemed intact. In another case the same condition was found.

Dr. Acker asked if clots left in the uterus would not at times check the hemorrhage. In some cases in spite of all remedies it seemed impossible to check post-partum hemorrhage.

REVIEWS.

The Diagnosis of Diseases of Women. A Treatise for Students and Practitioners. By Palmer Findley, B.S., M.D., Assistant Professor of Gynecology and Obstetrics, Rush Medical College in Affiliation with the University of Chicago; Assistant Attending Gynecologist to the Presbyterian Hospital, Chicago, etc. Second Edition, Revised and Enlarged. Pp. 588. Illustrated with 222 engravings and 59 plates. Lea Brothers & Co., Philadelphia and New York, 1905,

The features which led us to welcome the first edition of this book, two years ago, were its thoroughness, clearness and lack of superfluous material. The present enlarged edition shows a number of minor revisions, but chiefly extensive and important additions to the formerly limited chapter on diseases of the kidneys and to that on diseases of the ureters. The discussion of chorioepithelioma malignum is much increased in fulness, and that of cystic degeneration of the ovaries has been amplified by a review of the writer's personal study. Chapters on examination of the blood and bacteriological examinations have been added. The former is of questionable value. The few remarks upon the relation of blood conditions to gynecology would have been quite as useful without the incomplete description of technique.

Syllabus of Materia Medica. Compiled by Warren Coleman, M.D., Professor of Clinical Medicine and Instructor in Materia Medica and Therapeutics in Cornell University Medical College; Assistant Visiting Physician to Bellevue Hospital. Second Edition. Pp. 189. New York: William Wood & Company, 1905.

This little materia medica in a nutshell presents the subject in the concise form needed for the never-ending reviews by medical students. The editorial pruning knife has been freely used for the elimination of useless timber from the pharmacopeial forest. Be-

sides the preparation of each drug there is given a synopsis of its physiological and therapeutic qualities. In other sections drugs are grouped according to physiological action, dosage, and such practical results as production of eruptions, excretion in the milk, etc. Toxicology and symptoms of over-dosage are also considered in the new edition.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Pasteurization of Milk.—M. Perret (*L'Obstétrique,* May) describes experiments made by him with a view to ascertaining whether pasteurization is really of value in preparing milk for artificial feeding of infants. This method is not of easy application for mothers in their homes, because they have not the means of raising the temperature of the milk rapidly, nor of cooling it rapidly after heating. It has been shown by Marfan that if the milk is not cooled rapidly it becomes dangerous to the child. The author's experiments showed that the heat was not sufficient to destroy the bacteria in the milk, and that their activity continued when the milk was not rapidly chilled. At the same time the heat was sufficient to destroy all the milk ferments, and prevent their activity in the child's stomach. Since the year 1898, sterilized milk heated for 45 minutes at 100° has been used in the Clinique de Nourrissons of Tarnier, and there has never been a death from gastroenteritis. In the Maternity, the same milk was used from 1892 to 1898 with the same results. Hence the author questions the utility of pasteurization, and believes it may be most harmful in practical use in the home.

Barlow's Disease.—Filippo Pagliari (*Rivista di Clin. Ped.,* May) details a case of Barlow's disease observed by him, in a baby eight months of age, who was nursed for five weeks, and from that time was fed on sterilized milk. The condition of the child when seen at eight months was pitiable. It was unable to move its limbs, and showed great pain whenever it was touched or moved. Two upper incisors only were present, and the gums were swollen and hemorrhagic about them, as well as the lower gums, where the incisors had not yet appeared. There was progressive and persistent anemia, general depression, and grave cachexia. The neck and shoulders were covered with a copious pemphigoid eruption. The treatment by uncooked milk, with fruit juice, was rapidly effective, and the child entirely recovered. The author believes that in Barlow's disease we have, not a true infantile scurvy, but a new hemorrhagic disease distinct from all the others, with the syndrome of scurvy from lactation. This may, with much probability, be considered an infectious disease. Its occurrence with sterilized milk feeding is only a coincidence, since it has been ob-

served in breast-fed children also. Sterilized milk feeding is undoubtedly a contributing cause, because sterilization deprives the milk of its natural protective and inhibitory qualities, and allows the cause of the disease to operate more easily. He believes that there are more cases of this disease than have apparently been observed, and that, with increased accuracy of diagnosis, many more cases will be reported.

Nephritis and Breast Feeding.—Luigi Concetti (*Rivista di Clin. Pediatrica,* Jan.) advocates allowing an infant whose mother has nephritis to continue its nursing under certain precautions. The mother must not be injured by the feeding and the child must be carefully observed as to its digestion and weight, and its urine must be frequently examined to guard against the appearance of a nephritis. We do not at present know what renal poison causes the symptoms of edema, etc., in nephritis, or whether such poisons enter the breast milk. At the same time, many cases of babies nursing mothers afflicted with nephritis have been observed, in which no bad effects on either the mother or the child could be perceived. We know that if toxins pass into the milk, there pass also antitoxins and immunizing bodies, and it is very possible that immunity may be thus produced in the child. The author cites an illustrative case of a mother who had suffered for some five weeks with acute nephritis, whose infant had suffered in no way. On removing the child from the breast and substituting artificial feeding, diarrhea supervened, and became so severe in two weeks that it proved necessary to return the child to the breast. It was soon entirely well, increased in weight, and at the same time the mother seemed to improve. Roger, in the Hospital for Infectious Diseases at Paris, allowed 100 infants to nurse while the mothers were infected with measles, scarlatina, diphtheria, and erysipelas, taking all possible precautions to prevent direct contagion, and giving some cow's milk in addition when the mother's was diminished. In general, the children did well, and their mortality was much less than when placed on artificial feeding. The author considers it certain that the child nursing a nephritic mother stands a much better chance than if fed artificially, while, on the side of the mother, the health does not suffer from the nursing.

Deaths in Anesthesia in Childhood.—J. Blumfeld (*Clin. Jour.,* Feb. 1), after discussing cases of death during anesthesia, states his belief that the opinion is too widely held and acted upon that in the very young chloroform is the only suitable anesthetic; also that in cases of circumcision, when complete unconsciousness has been obtained, the anesthesia should be kept to a very light degree only. It is better that the nurse should have to control one thigh than that artificial respiration should become necessary.

Incontinence of Feces in Children.—Two cases of this condition are recorded by M. Ostheimer (*Univ. Penn. Med. Bull.,* Feb.). Both were boys, who suffered also from enuresis. Re-

covery rapidly followed the use of good food, fresh air, and strychnine. Ergot is also employed in such cases.

Suprarenal Apoplexy.—R. E. Pick (*Med. News,* May 13) reports a case of sudden death of a newborn infant. The autopsy showed diffuse hemorrhagic infiltration of both suprarenals.

Epithelioma of the Face.—A case reported by M. J. Lippe (*St. Louis Cour. Med.,* May) is of interest on account of the youth of the patient. The epithelioma was removed from the side of the nose of a child only four years old.

Congenital Tuberculosis.—This case is reported by Martha Wollstein (*Arch. of Ped.,* May) on account of its rarity. The mother died of advanced tuberculosis six days after labor; no autopsy permitted, but uterus removed per vaginam. Cheesy areas with tubercle bacilli were found in the endometrium and muscular coats and in the placenta; no tuberculous lesions in the umbilical cord or its vessels. The child died after 19 days. Autopsy showed a few small tubercles without giant cells in lungs, liver and kidneys. Smears from the heart's blood and umbilical vein were negative for tubercle bacilli. The infection was, however, evidently hematogenous.

Diagnostic Value of Tuberculin in Orthopedic Surgery.—W. S. Baer and H. W. Kennard (*Johns Hopkins Hosp. Bull.,* Jan.) report the results obtained in 40 cases of suspected tuberculous bone and joint disease, chiefly in children. These were positive in 25 cases, of which 6 were subsequently proved tuberculous by operation and 18 by history and response to treatment, while 1 is too recent to be of value. They conclude that tuberculin is the best and most reliable diagnostic agent for incipient tuberculosis of bones and joints, and its proper administration is attended by no permanent harmful results. The dosage is variable and it is rarely necessary to exceed 6 milligrams. The local signs are of equal, if not greater, importance than the general reaction, in bone and joint tuberculosis. Tuberculosis practically always reacts to tuberculin. While other diseases may possibly do so, the evidence is not conclusive. The diagnosis of tuberculosis can be made earlier and with more certainty by means of tuberculin than by radiography.

Infantile Paralysis of the Abdominal Muscles.—Judging from the number of reported cases, instances of residual paralysis of the abdominal muscles in acute anterior poliomyelitis are rare. W. B. Cornell. (*Johns Hopkins Hosp. Bull.,* Jan.) reports such a case in a child of 21 months. The left arm, right leg, and right half of the abdomen were involved.

Mechanism of Detachments of the Epiphyses.—A. Broca (*La Presse Méd.,* March 4) tells us that there are two possible mechanisms of detachment of the epiphyses in children: either the epiphysis is detached by direct violence or it is torn off by ligamentous traction. Direct traumatism is everywhere possible, but is rare; indirect is usually responsible, on account of the anatomi-

cal relations of the parts. In some of the joints, of which the wrist is typical, the ligaments are inserted on the epiphyses, therefore complete tearing off of these is possible. Clinical observation is in accord with anatomical considerations: separation of the epiphysis of the tibia is exceptional, while that of the femur is a relatively frequent occurrence, and is almost always produced by traction. Separation by direct violence is rare; that by muscular action is unknown. The head of the femur is an entirely intraligamentous articulation, and muscular traction is perfectly possible, but the author has never seen a case. Separation by traction from without is impossible. Clinically, separation is rare but very interesting. The occasion of the accident is very slight; the child does not fall, but feels a severe pain. It is able to walk, limping, and during the days following the femur becomes shortened. There has been a partial separation of the head, with gradual displacement. Hemorrhage into the joints is a consequence of these separations when intra-articular. When extra-articular, there is no hemorrhage, but there may be a fracture of the fragment of the epiphysis.

Movable or Wandering Testis.—Edred Corner (*Clin. Jour.*, Feb. 22) reports three cases of this condition, in boys 6 1-3, 8 1-2, and 14 years of age. In the first the cremasteric reflex due to handling the scrotum would result in complete withdrawal of both testes into the abdomen. The writer says that the condition of movable or wandering testicle is associated frequently with imperfect development and descent of the gland, with a large tunica vaginalis frequently derived from the so-called infantile hydrocele, and an enlargement of the abdominal rings and inguinal canal, which if allowed to persist will lead to the development of a hernia with an acquired sac. In the majority of cases no treatment is required. If it persists over about the sixth or the seventh year, or if a hernia develops, operation is indicated: orchidopexy, exploration of the inguinal canal for hernia, its treatment if found, and suture of the canal.

Vulvovaginitis Among Children.—In discussing a recent epidemic of gonorrheal vulvovaginitis in a hospital, A. C. Cotton (*Arch. of Ped.*, Feb.) urges the establishment of detention wards in every hospital for children, in which the patients may be watched for at least 14 days before admission to the general wards, in order to determine freedom from acute infections, and isolation wards for removal of suspicious cases. Female infants are especially susceptible to gonorrhea. Children with this disease should be isolated in the care of a special nurse and with individual toilet articles, bedding, etc. The physician and nurse should exercise as great care in sterilization before going from them to other patients as with other acute infectious diseases.

Rectal Gonorrhea in Vulvovaginitis of Infants.—Karl Flügel (*Berl. Klin. Woch.*, March 20) describes the occurrence of rectal infection in 20 per cent. of cases of vulvovaginitis in little girls.

There is in a few cases a true slimy discharge from the rectum, but usually it is observed only when a nasal speculum is introduced into the rectum, when little purulent lines of discharge are seen on the rectal wall. Some children complain of burning and desire to go to stool. Ulcers are rare. In some cases typical gonococci are not found in the discharge; in others they may continue to be found after 2 or more months of treatment. The causes are extension of the process from the vagina, infection by syringes or thermometers, opening of gonorrheal abscesses into the rectum, unnatural connection. Suppositories of silver nitrate or ichthyol give the best results. Injections of silver nitrate may also be used. The rectum becomes free from gonococci sooner than the vagina and urethra. This is due to the fact that the germs do not penetrate so deeply as in the vaginal mucous membrane, and hence the medication more easily reaches them. The author recommends that one should look for rectal infection in every case of vulvovaginitis of gonorrheal origin.

Gonococcic Infection of the Eye in Infants.—The prophylaxis of this affection, according to John A. Weeks (*Arch. of Ped.*, May) consists in the use of antiseptic vaginal douches before and during labor, the objections to which from the standpoint of puerperal infection are now known, and local treatment of the infant's eyes. The lids should be washed immediately after birth, and a drop of 2 per cent. nitrate of silver or of 25 to 35 per cent. argyrol dropped on each cornea. The treatment of gonorrheal ophthalmia includes gentle irrigation of the conjunctival sacs with a 3 per cent. sterile solution of boric acid every half hour, or less often, as is required to keep the eyes free from secretion. A 1 per cent. solution of silver nitrate should be applied thoroughly to the entire conjunctiva once daily, while the secretion continues. When this has virtually ceased, the solution is reduced to 0.5 per cent. and continued until the conjunctiva is nearly normal. Instead, protargol 10 to 15 per cent. may be dropped in every two hours until secretion has nearly ceased, when it is replaced by silver nitrate 0.5 per cent. once daily. Argyrol, 15 to 35 per cent., the stronger solution in severe cases, may be used by placing one or two drops in the conjunctival sac after its irrigation, every one or two hours, according to the severity of the case, less frequently as secretion diminishes. When it has ceased the boric acid solution alone is used until the conjunctiva is normal.

Anatomy of Congenital Hematoma of the Sternomastoid in the Newborn.—Ludwig Pincus (*Zent. für Gyn.*, No. 20) says that in most cases of swelling of the sternomastoid in newborn children the origin is traumatic. The swelling may be, in a few cases, a typical hematoma, with a secondary myositis of a chronic type. In most cases the myositis is the most important symptom. There is a typical mechanism for the production of this lesion. The swelling occurs in pelvic presentations as well as head presentations. It occurs in spontaneous delivery as well as after surgical

interference. There is a severe stretching of the muscle by separation of the two extremities in the rotation and descent of the child. An easy and rapid birth would predispose to this lesion, while a slower birth would not stretch the muscle as severely. It is more frequent with spontaneous births. Cases have been reported in which the lesion apparently did not occur during birth. One is reported in which the mother received a blow on the abdomen four weeks before labor. The child was born with swelling of the sternomastoid, and no pigment was found in the swelling such as to indicate the occurrence of a hematoma. Probably a blow was received by the child in intrauterine life at the time of the mother's injury. Some authors have thought that there might have been infection of a normal or injured muscle by way of the blood current or the lymphatics from the intestine. Syphilis may act as a predisposing cause.

Infantile and Juvenile Tabes.—Edgar Hirtz and Henri Lemaire (*La Presse Méd.*, May 20) tell us that juvenile tabes is a true tabes, and is now recognized as such. The most important diagnostic symptoms are pupillary abnormalities, changes in tendon reflexes and Romberg's symptom. Many of these symptoms may result from syphilis of the nervous system. Abolition of the reflex of the patella or Achilles tendon is the most important sign of lesions of the posterior columns of the cord. Romberg's sign does not appear in the early stages. The authors have collected in literature 46 cases of this disease, to which they add one case observed by them. None of them record autopsies, hence some may question the validity of the diagnosis. Occurring in young subjects fatal results of so chronic a condition have not been as yet recorded. The patients complain of visceral crises, of fulminating pains, troubles of sensibility, trophic and urinary disturbances as in older subjects, while incoordination is slight and not usually present early. The most constant early symptom in children is incontinence of urine, present in one-half of the cases. Amblyopia exists in 14 per cent. of cases, and is often the symptom for which the child is brought to the physician. Blindness sometimes results. The etiology of the trouble is usually hereditary syphilis.

Epidemic Cerebrospinal Meningitis.—F. Göppert-Kattowitz (*Berl. Klin. Woch.*, May 22) sums up the interesting diagnostic points gained from a series of 44 cases of epidemic cerebrospinal meningitis, treated by him during the present epidemic. Of these 44 cases only twenty showed the typical stiffness of the neck. In twelve children under three years of age, and seven under one year, stiffness was the principal symptom aside from the fever and pulse changes. In five children under three years this stiffness of the neck was the only symptom observed. In cases without stiffness there were three types: in one intracranial pressure and bulging of the sutures and fontanelles was the principal symptom. To this category belong nine children between six and eleven months old. All the sutures may be separated and a new fontanelle may appear over the mastoid, due to the tremendous

pressure. The prognosis in these cases is absolutely bad. In the second type, there are fever, rapid pulse and respiration, and signs of pain on passive motion, without any stiffness. The third type has a waxy yellow color, high fever and a purulent bladder catarrh. In all cases there was a rhinitis, and in some cases a cough suggested lung troubles. There were severe inflammatory eye symptoms in several cases, and sensitiveness to motion of the extremities in most of them.

Arthur J. Wolff (*Amer. Med.,* May 13) calls attention to the variability in size and grouping of the diplococcus meningitidis in different media, etc., extending from a very minute monococcus to large forms in tetrad or diplococcus grouping. The fact which suggested the possibility of obtaining therapeutic effects from injections of diphtheria antitoxin was that when a 24-hour bouillon culture of the meningococcus is mixed with 3 c.c. of diphtheria antitoxin of 1,000 units strength, a precipitate forms in 24 hours, and in 48 the liquid above is perfectly clear and devoid of organisms, while smears of the cocci in the precipitate stain with great difficulty.

G. L. Peabody (*Med. Rec.,* May 13) has tried the administration of diphtheria antitoxin in 22 cases of cerebrospinal meningitis, in all but one of which the diagnosis was confirmed by finding the diplococcus in the spinal fluid. One case received the first injection on the first day of the disease; five on the second day; six on the third day; four on the fourth day; and others on the fifth, sixth, and later days. In all cases fluid was removed by tapping, usually between two drams and one ounce. Of the twenty-two cases four received the antitoxin only subcutaneously, seven received it at different times both subcutaneously and intraspinously, and eleven received it only intraspinously. In only one case did it seem to cause any unpleasant effect, an urticaria which lasted several days after a single intraspinous injection of 2,000 units. She recovered completely from the disease. The doses varied from twelve hundred units to fifteen thousand. Only two patients received but a single dose each. In all of the others it was repeated at least once, and some received four, five, and six doses. The treatment was begun three months before the writer's report. Of the twenty-two, eleven had died, making a mortality to date of fifty per cent. Seven of these eleven died before the sixth day of the disease. Of the eleven dead one received the antitoxin on the first day of the disease; three on the second day; two on the third day; three on the fourth day, and only two later than the fourth day. Of the eleven still living, two were entirely well; two others were fully convalescent; five were still under treatment (no longer by antitoxin), with active symptoms and very grave prognosis; and two were practically moribund. The writer has observed no influence, good or evil, ascribable to the use of diphtheria antitoxin.

Tuberculous Meningitis.—The tabulation of 43 fatal cases of this affection occurring at the Children's Hospital, Carlton, by

W. H. Summons (*Intercol. Med. Jour. Austral.,* May 20) shows: (1) That tuberculous meningitis is a secondary condition. Of the 35 cases in which an autopsy was held, all had a more or less general tuberculosis. This shows the uselessness of trephining in their treatment. (2) The commonest seat of primary infection was the bronchial glands, usually of the right side. The percentage, where bronchial glands were the probable primary seat, was 66. As the bronchial glands drain a considerable lymphatic area, they themselves may be secondarily infected from some distal mucous membrane. (3) The mesenteric glands seemed to be the primary seat in 17 per cent. of cases. In these the bronchial glands were normal. In no case of this class was there a tuberculous ulcer in the intestine. (4) Double optic neuritis occurred in 45 per cent. of the cases, but choroidal tubercles were present in only one case out of these 29.

S. W. Curl (*Lancet,* May 6) has examined the blood of the ten cases of meningitis in children, eight of which were proved by autopsy to be tuberculous, while one had intestinal and peritoneal tuberculosis and the tenth had symptoms of the disease. He finds that the red corpuscles are usually present in normal or increased numbers; the majority of cases show no leucocytosis; the eosinophile cells are reduced in number, and the large lymphocytes and transitional cells are generally present in increased proportions.

Arthritis After Measles.—W. E. Darnall and M. Townsend (*Arch. of Ped.,* May) found swelling and tenderness of both ankle and knee joints about 8 days after disappearence of the rash of measles in an infant of 8 months, temperature 99°-100° F. This condition persisted in the right knee joint and 11 days later temperature rose to 102°. Five days after this the joint became red. There had been no symptoms of sepsis, but aspiration showed pus, so the joint was incised and drained, much pus being evacuated. There was apparently no bone disease. Death from exhaustion occurred within a week; no autopsy.

Treatment of Mumps.— G. Carrière (*Le Nord Méd.,* June 1) says that mumps is an infectious disease, epidemic and contagious, and that it should be treated accordingly, instead of being ignored as is done at present. The infection enters by the mouth or nasopharynx, invades the parotid gland by way of Steno's duct, and then enters the circulation. The contagion begins at once, and the child should be at once isolated. In schools the child should be at once excluded. At the end of two weeks the contagion is no longer to be feared. Isolation should be complete. Everything used by the patient should be carefully disinfected, the room also after the patient has recovered. The patient should be in bed, and should not go out until eight or ten days after the end of the fever. Nephritis has been observed after mumps. The nasal cavity, mouth and pharynx should be disinfected daily, and the parotid should be treated by internal medication with quinine and salicylate of soda, as well as by medicines that are eliminated by the saliva, such as mercury, iodides and bromides. The complica-

tions are otalgia, orchitis, and oophoritis, and all should receive appropriate treatment. The last two require rest in bed and tepid baths and applications.

Sudden Obstruction in Intubation without Surveillance.—E. Escat (*La Presse Médicale*, June 7) tells us that the two accidents after intubation that require a trained attendant are the expulsion of the tube and its sudden obstruction by membrane. The first accident is not a real danger, for the lumen of the larynx has been sufficiently stretched by the tube for breathing to continue long enough to send for a physician to replace it. The real danger is the obstruction of the lumen of the tube by membrane which has formed below it. If the obstruction be gradual it does not constitute a serious danger. The best method of preventing obstruction is to use a tube of as large caliber as the larynx can retain. When a small tube has been used the thread may be left in place in order to make traction on the tube in case of necessity. A steam of carbolic acid or thymol should be maintained in the room, to prevent drying of the air. Coughing should be provoked after introducing the tube, so as to cause the ejection of all membrane that remains in the trachea. The tube may be withdrawn by an attendant. It may be lubricated daily with a syringe with a menthol oil, or a resorcin glycerin solution. The administration of sedatives should be discontinued. The author has also introduced a set of tubes, made with oval openings in the sides, so that even if the lumen be obstructed, air may enter through them. He believes that it is much better to trust to intubation, even when there may be obstruction of the tube, which occurs once in 700 cases, than to do tracheotomy, of which the mortality is 10 per cent.

Prognosis of Pneumonia in Infants.—E. Terrien (*La Presse Méd.*, May 20) calls attention to the fact that although the prognosis of pneumonia in infants is usually good, there are several forms of sudden death to be feared. Some of these result from complications, especially purulent pleurisy, and pericarditis. One of the author's cases died suddenly when there was only involvement of the upper lobe of one lung, without any complications and in a previously healthy child of ten. At the autopsy nothing was found but an acute dilatation of the heart. There may be several forms of extrapulmonary infection in pneumonia, as has been shown by bacteriological examinations post mortem. The localization of the process depends on the receptivity of the individual and the resistance of the soil to the bacteria. This resistance varies in different animals, as well as with the age of the animal. Man is very resistant, but infants are less so. Cyanosis is often the only sign of trouble, coming but a short time before a sudden exit. This cyanosis may be a sign of a latent pericarditis, which is particularly dangerous.

Vesical and Urethral Calculi in Children.—Franco Crosti (*Gaz. Med. Lombardi*, May 29) describes vesical calculi in infants and

children as of quite frequent occurrence, especially in males. After puberty the number of cases diminishes rapidly. It is more common among the poorer classes than among the more well-to-do, and this is probably due to the preponderance of vegetable foods, since the majority of the calculi are of oxalate of calcium. Primary calculi are formed in the kidney, descend to the bladder and increase in size there. Secondary calculi are due to local causes in the bladder, cystitis and retention. The causes aside from the generally recognized ones of heredity, feeding, etc., are small size of the urethra, the coexistence of phimosis, and the frequency of infarcts of uric acid in the young. Small urethra favors the precipitation of salts in the urine, as does phimosis. There are rarely two or three calculi present in the same bladder. They generally occupy the fundus and are free. The principal symptoms are slight hematuria, disturbances of urination, generally retention, and sudden cessation of the flow, or incontinence, rebellious to ordinary treatment, and pain that is often very severe, causing the child to handle the parts for relief. Pruritus at the meatus is another symptom. This form of cystitis resembles tuberculosis of the bladder, having the same symptoms. Bacteriological examination is necessary to make the diagnosis between them. The bladder should be explored under anesthesia, and the calculus will be discovered by the sound.

OBSTETRICS.

Puerperal Neuritis.—Guiliano Pardoni (*Archivio di Ostet. e Gin.*, May) tells us that in reading modern authorities it is not difficult to find cases of paralysis occurring during the puerperal state, of peripheral nature, and arising probably from nephritis. Among other conditions is mentioned a polyneuritic psychosis, in which nephritic disturbances are accompanied by psychic symptoms. There are general excitability and whimsicality, the patient making inexplicable pretences; or there are apathy and indifference. Memory fails and the patient may become maniacal. There are also recorded paralyses of the arms, etc. The clinical expressions of neuritis are very various. They may include a mixture of motor, sensory, trophic, secretory and vasomotor phenomena. They may be marked or slight. They begin like an ordinary neuritis, preceded by paresthesiæ and pains, with or without fever. The course and duration are very variable, covering months or years, or only weeks. They may occur in the first three or four months of pregnancy, or at its end, or after labor. The etiology has been considered very different by various authors. Most refer it to incoercible vomiting. The neuritis of pregnancy seems to be the result of the accumulation of a toxin manufactured by the mother, and these complications to be the result of the nephritis. There have been no anatomical observations made, so that we know nothing of its pathology. The prognosis is good. Treatment by ergot and by salicylate of soda has done good.

Treatment of Puerperal Eclampsia.—From a critical study of the treatment of puerperal eclampsia, Hagopoff (*Bull. de la Soc. Belge de Gyn. et d'Obst.* t. XV., n. 5) draws the following conclusions: Medical, prophylactic or curative treatment should have an antitoxic action, so as to reestablish the function of the different emunctories. Milk diet and enteroclysis or hypodermoclysis, combined with bleeding, seem to answer the pathogenic indications; all promote diuresis, biliary secretion and intestinal antisepsis. Other therapeutic means, such as purgatives, diuretics, and inhalations of oxygen, act only as palliatives. Chloroform and choral simply combat the nervous symptoms; used with prudence they are not dangerous. Morphine and veratrum veride are not generally employed. The obstetrical method is rational; terminating labor has a beneficial influence on the mother as well as on the child. Cervical incisions and Cesarean section are dangerous; balloons and metallic dilators expose to danger of traumatism. Bimanual and digital dilatation, with anesthesia, is the best procedure. The best way to terminate labor is by natural means. In emptying the uterus the following conditions should be considered; (*a*) in case of severe convulsions before the child is viable, extract rapidly in the interest of the mother; (*b*) with severe convulsions the mother alone must be considered, before the seventh month; (*c*) when the child may live, and the mother will certainly die, save the child; (*d*) the interests of both are the same after the eighth month.

Causes and Evolution of Labor in Abortion.—E. Bonnaire (*La Presse Médicale,* May 3) asserts that the frequency of abortion has much increased in the last century. Mme. Lachapelle gave it as five in 1,000; during the first years of the author's service at the Lariboisière it was 123 in 1,000; in 1904, 230 in 1,000. The author questions whether most of these abortions arise from natural causes. They are usually assigned to injury, but this is in reality one of the rare causes of abortion. Causes of abortion fall under four heads: 1. Alterations of the fetus or ovum, arising from an imperfect development of one of the two parts of the ovum, embryonic, or extraembryonic. In the first case the error is teratological, in the second hereditary. In some cases there seems to be no reason for the cessation of development of the ovum. Extraembryonic lesions are those of the amnion, chorion and cord. There may be changes in the decidua, due to endometritis. 2. Pathological modifications of the uterus may be congenital or acquired. These are often anatomical—insufficiency or bad distribution of the muscular fibers; infantile, malformed, subinvoluted, or rigid uterus. Pelvic incarceration of the retroflexed uterus belongs in this category as do tumors and inflammatory adhesions. Functional anomalies include an especial tendency to contract, irritable uterus. Cancer, polypus, or uterine mole, and endometritis of pregnancy are in this class. 3. General conditions of the mother include plethora, internal or external hemorrhages, hemophilia, Bright's disease, cardiac accidents, syphilis, malaria,

lead poisoning, cancer, tuberculosis, diabetes. These cause death of the fetus, separation of the membranes, toxemia of the uterine muscle. Acute infections, such as typhoid, eruptive fevers, pneumonia, septicemia, acute poisons, kill the fetus, which acts as a foreign body. There are also intoxications produced by pregnancy: Eclampsia, incoercible vomiting, pernicious anemia. 4. On the part of the father there may be viciation of the spermatozoon as a result of the diathesis of alcoholism, syphilis, lead poisoning, malaria, tuberculosis, or cancer. Traumatism varies in its results according to its intensity, method of application, duration, and repetition, the stage of pregnancy, and the irritability of the uterus. It kills the ovum or separates the membranes. Traumatism of the genital organs from excessive coition and shocks received in walking is one of the most common forms. There are three types of abortion: Painful type, corresponding to the expulsion of a dead fetus; hemorrhagic, from hemorrhage, with slow detachment of the membranes; mixed type, including both forms of expulsion. In the early months the ovum is often expelled whole; later the expulsion takes place in two parts, as in labor, and they may be separated by a long interval, usually not more than twenty-four hours, however. During the first six weeks the ovum is practically all placenta, and is expelled whole. It often disappears in the clots. Hemorrhage dissects slowly, the ovum breaks, and is expelled in two parts. Expulsion whole is rare as late as the fifth month. The most frequent method of producing abortion is by puncture of the membranes, with some instrument, clean or dirty. The contractions of the uterus are the efficient cause of the expulsion of the fetus. They may be very strong and painful. They are due to reflex excitation of the uterus from pressure of the fetus on the perineal floor. The dilatation of the uterus may be slow, and it may not occur, so that the fetus is molded to a long form before expulsion. There are none of the phenomena of presentation, rotation, etc., on account of the smallness of the fetus. The apparent cause of rupture of the fetal abdomen, sometimes seen, is traumatism in production of the abortion. This is not a reliable sign of instrumental interference, for the author's experiments show that it may result from molding alone.

Ergot in Midwifery.—According to J. W. Dunbar Hooper (*Intercol. Med. Jour.*, Feb. 20) the use of ergot in obstetrics is declining year by year, it having been proved that post-partum hemorrhage, unless due to trauma or some blood dyscrasia, can best be met by other methods. In secondary hemorrhage due to separation of thrombi, not associated with deciduoma malignum, the free administration of ergot and strychnine is advisable. It is futile to give ergot until the source of the hemorrhage is accurately ascertained. The drug, instead of relieving after-pains, has the contrary effect.

Mortality in Childbed.—Robert Boxall (*Jour. Obst. and Gyn. Brit. Emp.*, May) finds that the total death rate from childbirth

has not diminished either in England or Wales, in Scotland or in Ireland, where it is abnormally high as compared with other divisions of the kingdom; but in London it has declined considerably. The death rate from accidents of childbirth has declined slightly in each division of the kingdom, but is abnormally high in Ireland, and in London has markedly diminished. The death rate for puerperal septic disease has, if anything, shown a tendency to increase in each division of the kingdom, but in London it has been declining for at least the last decade.

Abdominal Pregnancy.—Felix Meyer (*Inter. Med. Jour.*, Apr. 26), describes a case which he believes to have been one of primary abdominal pregnancy. The conditions found at operation support the theory that the fertilized ovum fell through the celomic ostium at a very early stage, and formed its attachment to the posterior wall of the uterus. The tubes and their fimbriated extremities appeared normal.

Dangers and Advantages of Schultze's Method of Respiration.—B. S. Schultze (*Münch. Med. Woch.*, Feb. 7, 1905) defends his method against charges of fatal injury to the child. He acknowledges that lesions may be found upon those children which have been examined after swinging. He also says that certain lesions are constant in babes that have been asphyxiated in utero, and that these lesions were well known to the older anatomists and pathologists before swinging had come into use. The most constant is a high degree of congestion of the liver. This is explained by an attempt made to breathe too soon, with the effect of starting the pulmonary circulation and causing a blood current to pass from the pulmonary veins to the left auricle. In this way the blood from the inferior vena cara, which till then has free passage to the left auricle through the foramen ovale, is obstructed, the congestion being most marked in the hepatic system. When the tension is too great the capillaries rupture, generally under the peritoneum, but also into the parenchyma of the liver. These hepatic lesions should not be charged against a method which has saved thousands of asphyxiated children. Schultze admits that the greatest caution is necessary in swinging immature children.

Burkhard (*Münch. Med. Woch.*, Feb. 7, 1905) believes that Schultze's method is far the best that we possess for resuscitating infants, but he calls attention to a lesion caused by the process of swinging. In children who died during labor and were spontaneously born and upon whom no attempt at resuscitation had been made, only the typical lesions of asphyxia were found, *i. e.* ecchymoses upon the pleura and pericardium, as a result of a futile attempt at respiration. In those subjects who had been swung, or upon whom version followed by extraction had been performed, there was found in almost every case hemorrhage into the spinal canal, either under the dura or pia or into the substance of the cord. These lesions are most apt to occur when the child is allowed to swing downward, especially if this is allowed to take place with any degree of force, as a hyper-extension of the spinal

column is caused, which results in tearing of the tissues. The hemorrhage may be absorbed without injury to the child. When an extensive hemorrhage takes place in the region of the medulla the prognosis is most serious.

Vaginal Cesarean Section.—Simon Strauss (*Med. Rec.,* March 28) states that vaginal Cesarean section is indicated in such abnormalities of the cervix uteri as carcinoma, myoma, rigidity, and stenosis; when the mother is in extremis; when the mother has a disease which threatens her life, such as lung, heart, or kidney affections; and in accidental hemorrhage with closed cervix. Vaginal Cesarean section has a wide scope in cases of eclampsia, when the patient is waterlogged, when she suffers from persistent headache, nausea, vomiting, rapid heart action, and amaurosis, and when there is no doubt that the uterus can be emptied in from 10 to 20 minutes, thereby saving great strain on organs already diseased and crippled. In cases of heart lesions, many hours' suffering can be saved by vaginal Cesarean section. In cases of placenta previa with rigidity, the supravaginal portion of the cervix not being dilatable, the operation should be done, as many a life has been sacrificed by temporizing with tampons and version. The writer reports a successful vaginal Cesarean section performed on a patient with cicatricial stenosis of the cervix who had been in labor for two days and who had become septic.

Cesarean Section for Placenta Previa.—Rudolph W. Holmes (*Jour. Amer. Med. Assn.,* May 20), finds that Cesarean section for placenta previa lowers the fetal mortality 30 per cent. and raises the maternal death rate nearly three fold. Unquestionably some maternal deaths have been suppressed, as in Cesarean sections for pelvic indications. A rigid os is one of the rarest complications of placenta previa. A true cicatrical cervix and the rigid cervix of an old primipara may offer an indication for Cesarean section in placenta previa. Pelvic contractions are indications for this operation in the presence of a previal hemorrhage; the pelvic contraction, not the previa, is the determining indication. The earlier the interruption of gestation, the more may pelvic deformity be disregarded. Cesarean section for placenta previa will never have as low a maternal mortality as when performed for pelvic contraction, as the acute anemia and the anatomic conditions all render it peculiarly dangerous.

Myasthenia Gravis.—J. E. Gemmell (*Jour. Obst. and Gyn.,* Apr.), reports performing a successful Cesarean section upon a woman aged 25, who had myasthenia gravis. Briefly, the clinical feature of this disease is weakness of some or all of the voluntary muscles, sometimes amounting to paralysis; after a long rest these same muscles may respond to the will, and again rapidly become exhausted. Cesarean section was resorted to in this case as the muscular involvement had become extreme and there was great danger of respiratory paralysis. After delivery there was some improvement in the myasthenia. The writer advocates emptying the uterus in these cases early in pregnancy.

Induction of Labor.—When necessary to induce labor, B. C. Hirst (*Amer. Med.*, May 6) prefers the bougie method, as it causes the patient the minimum of discomfort and risk and is easily and quickly performed. After scrubbing the vagina he inserts one or two fingers through the cervical canal and separates the membranes around the lower uterine segment, then introduces two bougies, size 17 French, and places a small tampon of iodoform gauze in the vagina. He makes no examination and does not remove the vaginal packing or the bougies till expulsive pains begin. If, at the end of 24 hours the bougies have not caused labor pains, they have at least led to marked softening of the cervix. The patient may now be anesthetized and placed on the operating table, the cervix dilated slowly to 6 cm., the forceps applied and the child delivered.

Artificial Dilatation of the Cervix.—Richard C. Norris (*Amer. Med.*, May 30) finds that the necessity for induction of premature labor by a method requiring less than twelve hours, is extremely rare. That most frequently employed and most satisfactory has been a combination of partial mechanical dilation followed immediately by the insertion of a bougie and an extraordinarily large Voorhees' bag incompletely filled. For the relatively rare cases of pregnancy or labor requiring accouchement forcè, the choice of rapid mechanical dilation depends especially upon the character of the cervix, the general state of the patient, and the firm determination not to attempt too rapid delivery. Bossi's or De Seigneux's instrument is cleaner, less tiresome, and while not more dangerous than manual forcible dilatation, applicable to the same class of cases.

Dührssen's vaginal section is a most valuable operation in the hands of an expert obstetric surgeon, and should be preferred to rapid metallic dilatation for the treatment of the gravest form of placenta previa and of accidental hemorrhage, except when conditions favorable to the latter are unmistakably present.

Lateral Section of the Pubis.—Leonardo Gigli (*La Presse Mèd.*, May 27) gives a resumé of all cases that have been so operated on up to the present time, 90 in number. He does not claim originality for the operation, which was advised by Champion and Stolz many years ago, but was never brought into practical use. After it was found that some of the results of symphseotomy were not all that could be desired, that the articulation became infected, and the remote results were not good, he desired to put in practice a section which should eliminate the joint wound and substitute for it an osseous wound. He, therefore, brought forward the section of the ramus of the pubes, and devised a new instrument for its performance. He operated on one case and found the results excellent. Since that time the operation has been performed by many French surgeons and by some of the Germans. With the exception of two cases, in which the technique was faulty, all the results have been good. Four other patients have died from entirely outside causes. The region of the symphysis has not

great surgical importance, and but few structures are to be avoided, *i. e.* the inguinal canal, the crural vessels, the clitoris and the articulation. The region is not very vascular, and the supply does not involve important vessels. The author advises that the incision should be made from above downward and should be inclined toward the median line, cutting the body of the pubes. The method should be the open one, the subcutaneous having no advantages over this. The author thinks the best name is lateral pubic section, as this expresses the kind of operation done. In all the cases operated upon the surgical wound healed by first intention with great facility. The loss of blood is very slight, since the hemorrhage comes only from Santorini's venous plexus, which does not communicate with the genital organs. Lacerations are not severe and heal by first intention when they occur.

Hebotomy.—Fritz Hammer (*Münch. Med. Woch.*, May 16) reports two cases of contracted pelvis, operated on by Hofmeier by hebotomy, with excellent results for both mother and child. Both operations were done according to the principles set forth by Gigli, though the instruments used differed. The first was a rachitic flat pelvis with a true conjugate of 8 centimeters; the second, with one of 7 centimeters. In one case the child was very large also. In one case the mother had a severe rise of temperature before the operation and tympanites of the uterus, indicating an undoubted uterine infection. In one, Döderlein's instrument was used, in the other an instrument similar to Gigli's. In one case bleeding was very slight, while in the other it was considerable. Instead of the gaping of the bones seen in symphyseotomy, the separation was not more than one centimeter after delivery, and five centimeters during the forceps operation. The wounds were easily closed, a rubber drainage tube being used, and the soft parts easily adapted themselves to the united bone. The secretion in one case was slight and drainage could have been dispensed with. Three weeks after the operation the patients, having lain on a firm bed on the back during the interval, were able to walk about without any change of gait. Both children left the hospital in good condition.

Surgical Sterilization of Women.—R. Chrobak (*Zent. für Gyn.*, May 27) discusses the justifiability of surgical sterilization of female patients for conditions that render pregnancy dangerous to health or life. Partial resection with removal of a large portion of the tube, has been proved in some cases unsuccessful by the results of the operation, after which pregnancy occurred. When the tube is resected the ovary is brought nearer to the uterus, and in case the tubal end is not entirely closed, or there is a uteroperitoneal fistula, an ovum may still be fertilized. The removal of the entire tube and the closure of the horn of the uterus is more successful. Vaginal fixation, as well as many of the major operations on the genital organs, may cause sterility as a secondary result. A condition that justifies artificial abortion may not justify castra-

tion, as there may be many family reasons why a woman may desire a child later. Abortion permits of the bearing of a child afterwards, while sterilization prevents it for life. Sterilization is never justifiable merely to permit of sexual intercourse without the consequences of pregnancy. If sterilization becomes necessary, the husband and wife should have the matter explained to them thoroughly, and should make a deliberate choice, shutting out the possibility of offspring. If they already have children, they will agree more easily than if childless. In case of the death of the husband, and the woman's remarriage, she might desire children, and in many cases she might be successfully delivered by Cesarean section, which, with modern technique, has become a comparatively safe operation. The indication for castration must be an entirely incurable condition, in which pregnancy threatens the life of the mother. If cure is possible, castration should not be done. In contracted pelvis of absolute type there is still the chance of delivery by Cesarean section. Chronic nephritis is an undoubted indication for sterilization. Psychic and nervous lesions are a doubtful indication, according to the author. Insanity may be curable. If severe, asylum treatment will probably render it needless to sterilize. In tuberculosis of the lungs and in other locations, a cure is possible, and artificial abortion may be performed. In chronic tuberculosis of the lungs, sterilization is justified to avoid the strain on the mother's system of bearing and nursing the child. In carcinoma of the uterus, the sooner the uterus is extirpated the better the chance of the patient. All lesions of the uterus that render delivery impossible, such as a healed rupture of the uterus, justify it, but the removal of tumors may still leave a useful uterus which will regain its function perfectly.

GYNECOLOGY AND ABDOMINAL SURGERY.

After-Treatment of Abdominal Operations.—P. L. Mummery (*Clin. Jour.*, May 17) advises for post-operative vomiting, the drinking a half pint of hot water containing 15 or 20 grains of sodium bicarbonate, or a half pint of cold water with three minims of tincture of iodine. Pain may be relieved by raising the shoulders on pillows and flexing the knees over a bolster; or the patient may be turned on the side with the knees and hips well flexed. If these means fail, give an injection of morphine which is also required for great restlessness. Meteorism may be relieved by introducing a short tube through the sphincters twice every twenty-four hours for one hour at a time. An enema containing turpentine should be given at once. If this is not effectual it should be repeated or a large oil enema given. Hypodermic injections of strychnine are of value. The writer believes that milk should not be given for the first few days, but instead albumin water flavored with lemon or sugar; he also lays stress on sugar as an article of diet in these cases. It is a safe rule that the sooner the bowels are open the sooner the patient is out of danger. For this, enemas are the best.

Uterine Fibroids.— J. Wesley Bovée (*Jour. Amer. Med. Assn.*, May 27) cites four cases of fibroids of the uterus developing after ablation of the appendages. It is improbable, though not impossible, that the fibroids existed at the time the appendages were removed. The writer finds but one theory on which to base a cause for the development of fibroids after double salpingo-oorphorectomy and that is that it is caused by the endarteritis obliterans noted by Benckeiser.

Prolapsus Uteri.—Charles G. Cumston (*Amer. Med.*, May 20) advocates colpectomy for cases of prolapsus uteri which come to operation after the menopause. This operation, which consists in excising the vagina, leaving the uterus in place, is extremely easy and should be accomplished in 20 or 25 minutes. The patients may be allowed to leave their beds in five or six days, which is a great advantage in cases of elderly women. If necessary, the operation can be carried out with Schleich's infiltration anesthesia.

Cancer of the Cervix.—John A. Sampson (*Alb. Med. Ann.*, May) divides cervical cancers into those arising from the vaginal portion of the cervix and those growing from within the cervical canal; histologically, into squamous celled carcinoma and cylindrical celled carcinoma, the latter the less frequent and more malignant. The growth may be either vegetative or infiltrating. The inverting or infiltrating type of growth is more frequent than the vegetative, also more malignant and harder to diagnose. There seems to be no relation between the size of the primary growth and the presence or absence of metastases. When metastases have formed, only a small percentage of cases can be cured, because it is impossible to remove all the lymph nodes which may be involved. When the uterus is freely movable and the growth apparently early, one should make a wide excision of the primary growth, freeing the lower portion of the ureters so as to remove as much as possible of the parametrium. If the patient is in good condition, the regional iliac lymph nodes may be removed. If the uterus is fixed from any cause the patient is apt to be in poor condition and the operation difficult. In these cases the first demand is a wide excision of the primary growth, resecting portions of the bladder and ureters if necessary. The removal of the regional pelvic lymph nodes may be omitted unless the patient is in good condition. The operation is not justifiable unless the entire local growth can be removed. The writer draws attention to the need of early diagnosis, as only from fifteen to thirty per cent. of cases in this country are operable when diagnosed, and only from ten to twenty-five per cent. of the cases operated on are apparently free five years later.

The Alexander-Adams Operation.—H. Fuchs (*Zent. für Gyn.*, May 27) discusses the advantages of the performance of Adams' modification of the Alexander operation. After experiences in searching for the ligament at the external inguinal ring and in the

inguinal canal, the author believes that this method is much safer, and more rapid. The incision is made through the aponeurosis of the external abdominal muscles, near the middle of the inguinal canal, and reaches the ligament where it has a greater diameter than at the end of the structure. Thus, the ligament is much easier to find. Another advantage is the avoidance of Imlach's fatty areas, which obscure the ligament. The inguinal nerve here serves as a guide to the ligament better than at the external ring. The incision need not be more than three centimeters long. In 221 cases, operated on at the Frauenklinik at Kiel, from 1896-1903, 77 were by the old, 144 by the new method. There were many reasons that rendered the ligament difficult to find, besides its thinness: abnormalities of the ligament, fat in the canal, large canal of Nuck, old hernial sac, varices of the veins, adhesions to the external oblique muscle, or to the peritoneum, and hemorrhage, are all assigned as causing difficulty in the old method. There is no fear of production of hernia by the new method. In 66 cases that were examined some time after the operation, there was a thickening of the fascia such as to prevent hernia. The closure of the canal after Bassini's method also ensured against hernia. In 69 cases examined, the uterus was found still in retroflexion in 10 cases; in 2, from thinness of the ligament; in 3, from adhesions binding it down. These adhesions indicate a general disease of all the genital organs, which could not be remedied by the operation. Of 69 cases examined, 47 were free from pain due to pressure on the inguinal nerve. Of 54, 8 became pregnant after operation.

Advantages of Direct Cystoscopy in Woman.—Georges Luys (*Ann. de Gyn. et d'Obst.*, May) details the advantages of direct cystoscopy over the method with a prism, in the female sex: 1. Direct vision. Objects look more natural and less deformed. 2. There is no necessity of changing the relations of structures by filling the bladder with water. 3. By direct examination a small, inflamed bladder may be examined. 4. Hemorrhage does not obscure vision by coloring the medium. 5. There is opportunity for direct modification through the cystoscope. 6. When it is necessary to catheterize the ureter there is no danger of infecting it from the bladder. The difficulty in applying this method arises from the narrowness of the urethra, and the difficulty of distending the bladder. The author has devised a cystoscope to obviate these inconveniences, which he describes as easy of sterilization and manipulation, and giving perfect vision. Instead of using the knee-elbow position, as is done in America, to cause air to pass into the bladder, he elevates the pelvis and allows it to enter through a tube in the cystoscope.

Inguinal Hernia of the Uterus and Histological Changes in the Displaced Ovary.—Richard Birnbaum (*Berl. Klin. Woch.*, May 22) considers the subject of hernia of the uterus, so-called hysterocele, a very rare condition. The hernia may be inguinal, femoral, umbilical, through the linea alba, or through the weak-

ened abdominal muscles themselves. The author's case occurred in a woman of 35 years, married, but who had never menstruated. She had an infantile uterus, a left ovary of rudimentary type, without the normal elements of the ovary, and showing no corpora albicantia, no right ovary or tube, and a left tube without any fimbriated extremity. The whole mass which had pushed through the inguinal ring and descended into the labium, was removed, and the patient recovered well. Intercourse had been possible and the patient was not without conjugal feeling. She had complained of heavy pain, but apparently without any periodicity. The author has collected from literature 23 cases of uterine hernia of inguinal type. In 8 cases pregnancy had occurred, but spontaneous delivery could not take place, and operation became necessary. The adnexa were united with the uterus in most cases. Of crural hernia only two cases were found, neither of them in pregnancy. In the linea alba, hernia results from stretching by repeated pregnancies. It may occur as a result of ventrofixation. According to some writers this condition results from adhesive peritonitis; but most authorities, including the author, consider it as of congenital origin, resulting from maldevelopment of the genital organs during intrauterine life, and most cases have combined with the condition some malformation of the genitals. Most of the cases are of the left side, due to the normal tension of the uterine ligaments toward the left. Of the 8 pregnancies, one ended in abortion, two in premature labor; four were terminated by Cesarean section, one by Porro's operation. In most cases there is spasmodic pain at the menstrual period. Taxis is useless, and operation is the only resort. When the genitals are rudimentary they should be removed. If normal, they may be separated from the hernial sac and returned to the abdomen.

ITEM.

The American Association of Obstetricians and Gynecologists will hold its eighteenth annual meeting at the Hotel Astor, Longacre Square, New York, Tuesday, Wednesday, and Thursday, September 19, 20 and 21, 1905.

Dr. Robert T. Morris, 616 Madison avenue, chairman, Dr. Samuel W. Bandler, 229 West 97th street, and Dr. James N. West, 71 West 49th street, constitute the local committee of arrangements, one or all of whom will gladly furnish information to members and guests upon application. All members of the medical profession are cordially invited to attend the scientific sessions.

The following is a list of papers offered up to the present date:

The president's address, H. W. Longyear, Detroit. 1. Title to be announced, J. H. Carstens, Detroit. 2. Title to be an-

nounced, Magnus A. Tate, Cincinnati. 3. Personal experience in hysterectomy for myofibroma of the uterus, Miles F. Porter, Fort Wayne. 4. Title to be announced, J. W. Hyde, Brooklyn. 5. Diagnosis, John B. Deaver, Philadelphia. 6. Treatment of procidentia uteri, H. E. Hayd, Buffalo. 7. Perineal injuries and methods of repair, Joseph Price, Philadelphia. 8. Title to be announced, H. C. Pantzer, Indianapolis. 9. Appendicitis as a factor in the diagnosis of abdominal and pelvic diseases, Rufus B. Hall, Cincinnati. 10. Title to be announced, W. A. B. Sellman, Baltimore. 11. Indications for hysterectomy in puerperal eclampsia, Charles G. Cumston, Boston. 12. Title to be announced, Edwin Walker, Evansville. 13. Title to be announced, John Young Brown, St. Louis. 14. Papillary cystadenoma of the breast, Edward J. Ill, Newark. 15. Normal saline solution and its application to conditions, W. B. Dorsett, St. Louis. 16. Colon bacillus leucorrhea, R. T. Morris, New York. 17. Gallstones in the cystic duct, L. H. Dunning, Indianapolis. 8. Title to be announced, O. H. Elbrecht, St. Louis. 19. Pelvic infection—etiology; routes of invasion; pathologic changes and clinical courses, John B. Murphy, Chicago. 20. Surgery of the liver, W. J. Gillette, Toledo. 21. The treatment of puerperal eclampsia, E. G. Zinke, Cincinnati. 22. The evolution of the anterior transplantation of the round ligaments for uterine displacements, A. H. Ferguson, Chicago. 23. Title to be announced, H. Howitt, Guelph. 24. Myomectomy, W. P. Manton, Detroit. 25. Title to be announced, T. B. Eastman, Indianapolis. 26. Extraperitoneal pregnancy; three cases of prolonged gestation; operation by marsupialization; recovery, C. A. L. Reed, Cincinnati. 27. Title to be announced, F. F. Simpson, Pittsburg. 28. Title to be announced, L. S. McMurtry, Louisville. 29. Some general principles in conservative pelvic surgery, J. F. W. Whitbeck, Rochester. 30. Title to be announced, C. L. Bonifield, Cincinnati. 31. Title to be announced, J. D. S. Davis, Birmingham. 32. Title to be announced, X. O. Werder; Pittsburg. 33. Title to be announced, B. S. Dunn, Easton. 34. Observations respecting treatment of face presentations, A. P. Clarke, Cambridge. 35. Title to be announced, C. C. Frederick, Buffalo.

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ORIGINAL COMMUNICATIONS.

MALIGNANCY IN UTERINE MYOMATA.*

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Uterine myomata, more properly called fibromyomata, are typically benign and innocent growths, which only cause trouble by reason of their mechanical presence, resulting in pressure symptoms; by reason of their influence upon the uterine musculature and endometrium, resulting in hemorrhage, and by reason of their degeneration, resulting in gangrene, infection or malignancy. Many a woman carries a myomatous tumor in her uterus unknown to herself. Sometimes its presence is only revealed when it obstructs or complicates labor, sometimes when genital bleeding calls attention to it, sometimes when its increasing size interferes with bladder, rectum or other pelvic organ, or causes it to rise into the patient's perception in the abdomen, sometimes when the secondary results of its degeneration or infection cause more or less alarming symptoms. The neurotic element must not be belittled. The knowledge of the presence of a growing tumor, even if she is

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assured that it is entirely benign, is a source of much anxiety to the average woman, as indeed it would be to the average man. It is my purpose to consider only the question of malignancy in myomatous tumors of the uterus; how often it occurs, what are its varieties, what are the clinical and pathological appearances, and how far should the chances of the supervention of malignancy go in determining our decision for or against operation.

Some authors, notably Uleska-Stroganova, describe a peculiar form of malignant degeneration in myomata which appears to be not true sarcoma, but in which the characteristics of malignancy are pronounced. It is considered that there is a special form of malignant disease arising in myomata whose starting point is the muscle cells. This is called leiomyoma malignum. Clinically, the tumor shows its malignancy by its rapid growth, its tendency to recur and the frequent occurrence of metastases. Microscopically, the matrix of the development of the malignant myoma is the muscle cell. There is an extraordinary difference in the cell forms. Polynuclear cells are abundant. There are also numerous and diverse cleavage figures. The elongated cells are seen in various stages of change, from the ordinary unstriped fiber of the myoma and the uterine wall to spindle-shaped bodies differing little from true sarcomatous elements. There is in the tumor a preponderance of young muscle cells. These authors would believe that there is a special malignant myoma distinguishable from sarcoma of the uterus; even from sarcoma arising in fibromyoma. It is more frequent than generally supposed, being usually classed with ordinary sarcoma. True sarcomatous degeneration of a uterine myoma is considered by Stroganova as very rare. Tumors which show young muscle tissue and which certain authors describe as sarcoma, others as ordinary myoma, must be carefully observed for quick changes and a tendency to undergo malignancy.

It seems to me unprofitable to try to distinguish malignant diseases of the mesoblastic type in the uterus as malignant myoma and as sarcoma. The definition of sarcoma is a malignant neoplasm composed of mesoblastic elements. Its origin may be in muscle, in connective tissue elements between muscle fibers or in the connective tissue of the endometrium. Unless we contend that all sarcomata of the uterus arise from the endometrium or from the connective tissue of the uterine wall and not from the muscle elements, we are not justified in classing as a tumor of a separate variety those malignant neoplasms which take their origin

from the muscular cells of the myoma itself. The dividing line between these latter growths and tumors which would by everybody be classed as sarcomata, is vague. Some malignant growths of the uterus there are which are largely composed of cells apparently recently developed from young muscle cells. These indeed are usually soft, and of rapid growth. There are other malignant mesoblastic tumors composed chiefly of spindle-shaped connective tissue cells. These are usually harder and perhaps do not exhibit so rapid a malignancy. Between these are many varieties of tumors, composed of young muscle cells, spindle cells, large round cells, small cells and polynuclear cells in varying proportions. The same tumor in parts not very widely distant may show different stages of all the above characters. These tumors are all more or less malignant, in that they tend to recur, to grow rapidly, to become necrotic and to form metastases. They are consequently all sarcomata. There are tumors arising in the endometrium of the body or the cervix, entirely independent of myomata, which exhibit characteristics grossly and minutely different from the sarcomata which we are considering. They are rather more apt to be composed largely of round cells, and their spindle cells have no appearance of muscle fibers. Macroscopically, they are usually more or less pedunculated or grape-like in appearance and project into the uterine or cervical cavity, resembling adenomatous growths.

The change from muscle cell to spindle cell has been observed and demonstrated by drawings and specimens by several authors. Von Kahlden, in 1893, was the first to trace this change of the muscle cell of a myoma to the spindle cell of a myosarcoma. Whitridge Williams the following year also demonstrated a case. Pick and Chrobak have since confirmed these observations by reports of cases studied by them. On the other hand, Ricker thinks that Williams and Pick mistake for a metamorphosis of the muscle cells spindle cells of the sarcoma growing in between the muscle cells. Other authors consider that the sarcomatous cells arise from the adventitia of the blood vessels of the fibromyoma.

A fibromyoma of the uterus is composed, in varying proportions, of the smooth muscle fiber, little different from that of the uterine wall, and of connective tissue bundles, differing only in their arrangement from the same elements in the uterus. There is never a true myoma of the uterus except at the very earliest stages of growth. There is almost never a true fibroma of the uterus. It is probably true that the softer tumors, composed

mostly of muscle tissue, are more prone to malignant degeneration than the older and harder ones composed mostly of connective tissue.

Sarcoma arising from fibromyomata of the uterus or existing coincidently therewith is by no means common. McDonald observed only three in 280 fibromyomata operated upon by him or seen at autopsy. Noble, among 278 cases operated upon, found only 2 cases of sarcoma. A. Martin, out of 205 cases of fibroid tumor, saw only 6 where sarcomatous degeneration of the tumor had occurred. Baker and Graves observed three sarcomata among 33 cases of fibroids. Frederick reports a series of 125 cases of fibromyoma in 2 of which sarcoma was present. Küstner believes that 3 per cent. of fibroids become malignant, usually by the appearance of sarcoma. Eastman states his opinion that 5 per cent. of uterine fibromata undergo sarcomatous degeneration, but supports it by no statistics. Hunner, in 100 consecutive cases of fibroids of the uterus, observed sarcoma twice. In Klein's series of 138 cases of fibromyoma, 3 were sarcomatous. Scharlieb, analyzing 100 consecutive and unselected cases, states that she observed sarcoma 6 times. Cullen thinks that from 1½ to 2 per cent. of fibromyomatous tumors become sarcomatous. Haultain considers sarcomatous or other malignant degeneration of a fibroid tumor of the uterus very rare, even if an authentic case has really ever been proven. He considers the existence of the two together as merely coincident. In 400 cases of fibromyoma he saw only one sarcoma. The figures of Cullingworth are similar. He saw one case of myxosarcoma in 300 cases of myoma. In 300 of Simpson's cases of fibroid none was found to have undergone malignant degeneration. On the other hand, von Franqué estimates the frequency of sarcomatous change in myoma of the uterus to be between 3 and 4 per cent.

Whitridge Williams divides sarcoma of the uterus into two classes. The first he calls *myoma sarcomatodes*. This is a sarcoma springing from the muscle cells of a fibromyomatous tumor. The second he calls *myosarcoma*. This is merely a mixture of myomatous and sarcomatous cells due, as a rule, to sarcomatous change in the connective tissue elements of the tumor. To these Weir would add a third class, namely, a malignant neoplasm resulting from sarcomatous changes in the connective tissue of the uterine wall without the previous existence of any myomatous tumor. A fourth class ought to be added, namely, the sarcoma arising in the connective tissue of the endometrium of body and

cervix. The majority of uterine sarcomata are of this fourth variety. They form circumscribed polypoid growths or diffuse infiltrations, both varieties subsequently infiltrating the wall. The sarcoma of the cervix, less common than of the body of the uterus, assumes a peculiar grape-like form, or often a polypoid or nodular type.

Abel says that the sarcoma which begins in the wall of the uterus is usually sarcomatous degeneration of myoma. Gebhard considers sarcoma of the uterus relatively frequent. The myosarcoma loses the bundle form in the arrangement of its elements and becomes more homogeneous in appearance. Considerable necrosis is common and also many areas of hemorrhage throughout the growth. The sarcoma often extends beyond the original bounds of the myoma. Beyea looks upon sarcoma of the uterus as a metaplasia of myoma into sarcoma. A softening and necrosis begin early in the center of the affected tumor, often with great blood extravasation. The sarcoma cells are large and often polynuclear, containing much chromatin. The spindle cells are large and often polynuclear, and contain much chromatin. The spindle cells retain their form for a long time, showing origin from the muscle cell. Sänger believes that all myomata containing giant cells are sarcomatous.

Sarcomatous change in a fibromyoma of the uterus shows itself by signs and symptoms of rather significant character. A myomatous uterus has perhaps lain dormant for several or many years, perhaps causing few symptoms, perhaps only noticed because of its size, perhaps not even suspected. Within a few weeks or months a rapid growth of the tumor within the abdomen has taken place. When the tumor, thus increasing in size, is a submucous one, it often happens that portions of it are cast out of the genital tract piecemeal. These pieces are usually more or less necrotic and are usually accompanied by a discharge which smells offensively. Microscopic examination of such discarded portions often will show sarcoma. If subserous or interstitial, the tumor may be locally softened. Cachexia is not long in making an appearance. The commonest time for the supervention of such symptoms is a little while after the menopause, sometimes several years later. Infection of the softened regions or of the endometrium over an intramural fibroid of this character may often occur, accompanied by hectic symptoms. The most marked signs, however, are the sudden rapid growth and the softening.

Such tumors removed by myomectomy, by subtotal hysterec-

tomy or by spontaneous extrusion per vaginam, show myomatous nodules in the substance of which are areas of softer and more homogeneous tissue, often of a paler hue than the rest, sometimes containing numerous hemorrhagic extravasations.

The sarcomatous disease usually develops in the substance of one of several myomata, and may exist in the subserous, interstitial or submucous varieties indefinitely. The firm cross-grained fibromyomatous tissue is replaced by a homogeneous yellowish-white growth, devoid of fibroid arrangement, and closely resembling raw pork. Various further degenerations in the sarcoma tissue are frequent. The microscope reveals spindle cells replacing the muscle cells. In some places spindle cells are situated between the smooth muscle fibers, in other places the latter are entirely replaced by the former. Polynuclear cells are frequent. In many tumors of this class large and small round cells are numerous, but in most or all of the sarcomatous degenerated myomata the spindle cells are the chief neoplastic elements.

Carcinoma, contrary to the opinion expressed by many authors, is a more frequent accompaniment of fibromyoma of the uterus than is sarcoma. A direct etiological sequence can be more frequently traced in fibromyoma and sarcoma than in fibromyoma and carcinoma. However, the two exist in the same uterus in the latter instance more often than in the former, because carcinoma is a commoner primary neoplasm of the uterus than is sarcoma.

Carcinoma may arise from several sources in a myoma of the uterus. It may extend from the mucous surface of a polypoid carcinoma of the body or from the glandular structure of an adenoma malignum. Such a tumor Gebhard calls myocarcinoma. A few authors believe that the muscle cells of a myoma themselves may change and become of the epithelial character of carcinoma, just as they may become changed into the spindle cells of sarcoma. The occurrence of such a metaplasia has not been proven. It seems to me unnecessary to bring in this theory to explain phenomena which can be more plausibly explained otherwise. Remains of the Wolffian ducts may be included within a myoma and may undergo carcinomatous growth. The so-called adenomyoma is a cystic fibroid tumor, usually of the posterior uterine wall, in which these Wolffian remains have greatly hypertrophied, but have not become malignant.

Roger Williams states that carcinoma co-exists with fibroids in 9 per cent. of the cases of the latter, but that carcinomatous degeneration of the fibromyoma is of rare occurrence. Dorland

reports a case of carcinoma of the body of the uterus where the diagnosis was made by examination of the curetted scrapings. On removal, the uterus was found infiltrated with small nodular fibromyomatous growths, some of which had become involved in the cancerous process. One, near the mucous membrane, just above the cervix, showed adenocarcinoma, which was also seen on the mucous membrane covering the fibroid. A second tumor was a small polyp of a glandular character, but not malignant. A third was a small fibroid polyp with carcinomatous degeneration on its surface.

It seems well established that carcinoma of the uterus accompanying myoma is more common than sarcoma complicating the same tumor. Among McDonald's 280 cases of fibromyoma were 6 cases of adenomyoma, 6 associated with adenocarcinoma of the body, 2 of carcinoma of the cervix, and one of chorioepithelioma malignum. Noble, among 278 cases of myoma, had 6 of adenocarcinoma of the corpus, 4 of epithelioma of the cervix, one of chorioepithelioma malignum, and one case of carcinomatous infiltration of the fibromyoma arising from adenocarcinoma of the body of the uterus by metaplasia. Martin's 205 cases of myoma were accompanied by adenocarcinoma of the corpus in 7 and carcinoma of the cervix in 2. Frederick, among 125 cases of fibroid of the uterus, had 6 cases of carcinoma of the body and 2 of epithelioma of the cervix. Scharlieb's series of 100 cases had carcinoma complicating the fibroid in 2 and one case of carcinoma invading the fibroid tumor itself. Hunner's 100 cases had accompanying carcinoma of the body in 3, adenomyoma in 2, and carcinoma of the cervix in 2.

That there is an etiological relation between andenocarcinoma of the corpus uteri and fibromyoma seems probable, although the exact relationship cannot be stated. Richelot says that every fibroma of the uterus is accompanied by hypertrophy of the mucous membrane of the uterus. He also expresses the opinion that fibroids really predispose a uterus to malignancy. Wyder and von Combe tend to show by their studies that fibroma induces hypertrophy of the mucous membrane. It has long been the opinion of gynecologists that the hemorrhages in cases of uterine fibroids were caused by hypertrophic endometritis accompanying the tumor and caused thereby. On the other hand, Theilhaber and Hollinger, in a study of 19 cases of myomatous uteri, found that the bleeding fibroids were accompanied with little or no hyperplasia of the endometrium, while in those which did not bleed the

mucous membrane averaged a little thicker. The muscular layer is always much thicker in myomatous uteri and also in carcinoma of the body.

It is unlikely that the causal connection between fibroids and carcinoma of the body is on the side of the carcinoma influencing the fibroid, because the growth of the carcinoma is usually rapid, while that of the non-malignant fibroid is slow. When a fibroid is present in the wall of the uterus, the rest of the wall is much thicker than normal and the blood supply to the whole organ is greater. The tendency is to a supernutrition of the endometrium and a hypertrophy of the glandular portion, which frequently may go on to malignancy. The fact remains, however one explains it, that adenocarcinoma of the body is relatively more frequent in myomatous uteri than in others.

Babcock gives a careful pathological report of three cases operated upon by Noble. They were three hysterectomies for medium-sized multiple myomata complicated with carcinoma. Two were affected with adenocarcinoma of the body and one with extensive epithelioma of the cervix. All three were in women considerably past the menopause. The symptoms began with irregular hemorrhage and a later serous and offensive discharge.

Numerous authors write of the relative frequency of adenocarcinoma of the body of the uterus accompanying fibroid tumors. These tumors are usually interstitial or submucous, just the sort which cause most circulatory disturbance and irritation to the endometrium and musculature of the uterus. Roger Williams describes 7 cases of cancer of the uterine body, 2 of which were accompanied by fibroids and a third which had been operated upon five years before for the removal of a submucous fibroid. In one of the cases the epithelial growth had penetrated the myoma itself. Stone gives 4 cases of malignant adenoma of the corpus uteri, in which the uterus was inspected, and in one subperitoneal and interstitial fibroids were present. Kelly reviews 100 cases of uterine cancer and finds that fibromyoma was also present in 8, 6 of which were adenocarcinoma of the body, 1 adenocarcinoma of the cervix and 1 epithelioma of the cervix. Schroeder estimates that only 3.4 per cent. of uterine carcinomata originate in the body. If, therefore, adenocarcinoma of the body and fibromyoma were merely coincident, we would not expect that the two would be found together so much more often when the cancer was in the body than when it was in the cervix. If merely coincident, we would expect the proportion of coincidences in the cervix to

be as great as the proportion of preponderance of cervical over corporeal cancer.

Croisier reports one interesting case, which illustrates one phase of the question. A woman of 39 years began to experience a prolongation of duration of the menses, a slightly increasing frequency and an increasing loss of blood. The severity of these symptoms progressed until in a few months the hemorrhages were almost constant. Through the speculum a polyp could be seen protruding through the os. This seemed to account for the hemorrhage, and tampon was employed to dilate the os preparatory to snaring off the polyp. When dilatation was accomplished it was found that the pedicle was too large for snaring. Some pieces of the tissue of the polyp removed in the efforts to snare were subjected to microscopic examination and adenocarcinoma was found. A supravaginal amputation of the uterus was performed. A spherical tumor of whitish-yellow color and the size of a pigeon's egg was attached by a pedicle at the fundus, the tumor filling the uterine cavity. Several nodules as large as peas were at the base of this tumor. The structure of the tumor was of young connective tissue elements, and muscle fibers, with a preponderance of connective tissue. At the level of the pedicle the mucosa of the uterus was of a papular form, thickened and ulcerated. There was no line of demarcation between the mucosa and musculature. Numerous epithelial tubes penetrated the muscularis; in short, there was a typical adenocarcinoma around and at the base of the fibroid polyp. The rest of the endometrium showed signs of endometritis. In the discussion, Richelot stated that it was not necessary to establish a causal relation between fibroid and adenocarcinoma, that the former be large. Of 4 uteri removed recently by him for carcinoma of the body, all possessed fibromyomata in addition. He deduces the conclusion from his experience that a fibromyomatous uterus is a soil on which carcinoma may readily develop. Malignant disease of the cervical stump recurring after subtotal hysterectomy is considered by this author to be sufficiently common to warrant panhysterectomy in all cases. In his experience this occurred in 3 cases out of 13. Bland Sutton reports a case where carcinoma was present, unsuspected, in a case of total hysterectomy for fibroids and reappeared in the vaginal cicatrix.

Malignant disease, as has already been stated, is a rarer form of complication of fibroids in the cervix than in the body. Haultain, in his long experience, saw it only once with a large fibroid and 3

times with small fibromyomatous nodules. Grube records a curious case of delivery *per vias naturales* of a fibroid polyp as large as a hen's egg in a woman suffering also from an inoperable carcinoma of the cervix involving the bladder. There was no carcinoma of the body.

As we have seen, the presence of adenocarcinoma of the body in connection and in the same uterus with fibromyomatous tumors is not very rare; is indeed common enough to make it a serious factor of the disease, in our estimation. The actual invasion of the myoma by carcinoma cells is not often recorded; indeed, it is a very rare occurrence. Such a case is recorded by Scharlieb. The patient was a single woman, aged 61. Intermittent hemorrhages and foul discharge from the uterus led to examination and discovery of an enlarged uterus and carcinoma of the cervix. The bulk of the organ was caused by a fibromyoma, one portion of which was attacked by carcinoma of the same histological structure as that of the cervix. No direct extension of the cervical growth could be traced upwards into the corpus.

Noble reports a case of invasion of the fibromyoma by adenocarcinoma of the body. A virgin, aged 63 years, who had passed the menopause at 45, began to have profuse and foul-smelling leucorrhea, with frequent slight hemorrhages. There was also irritability of the bladder, with occasional incontinence. A clinical diagnosis of degenerating fibroid was made from these symptoms and the discovery that the uterus was much enlarged and nodular. Curettage and microscopical examination revealed no carcinomatous scrapings. Supravaginal amputation was performed. The uterus was as large as a fourth month pregnancy and contained in its cavity a pedunculated fibroid. The endometrium appeared normal macroscopically but microscopically showed adenocarcinoma at the apex of the fibroid and on the opposite wall. Within the fibroid were numerous areas of carcinoma, in considerable part resembling squamous-celled cancer, but also showing something of the adenomatous type. The cervix is reported to have looked normal at the operation, and was not removed.

A few other cases of extension of carcinoma from other parts of the uterus and cervix into the tissues of the myoma are reported, and one case of metastasis into the fibroid from cancer in the lung.

How far does our present knowledge of the probabilities of the supervention of malignancy in a fibromyoma justify us in making rules for operation upon such tumors? What fibromyomata

should be operated upon and what may safely be left without operative interference? It is not my purpose to consider those indications for operation like complications with ovarian or tubal disease, necrosis of the tumor, twisted pedicle of a pedunculated fibroid, pressure on neighboring structures causing symptoms, complication with pregnancy and the like. To all of these factors as indications for operation may be added the possibility of malignancy. If operation is decided upon, is myomectomy the proper procedure, or should the uterus be totally or partly removed in all cases.

Most modern authorities advise operation if symptoms are present which threaten life or which cause suffering or even great discomfort. Hirst would operate in only 20 per cent. of his cases of fibromyoma. It is generally conceded at this time that no other treatment except operation is worth trying or indeed safe to try. That is, in other words, if we do not operate, we ought to let the tumor alone. If the tumor demands any treatment, except that of a placebo, it demands operative treatment.

R. Williams attempts to prove that fibromyoma of the uterus is not a very fatal disease. Others have stated that the mortality of operations undertaken for fibroids is greater than the average mortality if the tumors are left without treatment. In the report of the Registrar-General of England for 1901 it appears that, out of a population of seventeen million females, only 339 are recorded as having died of uterine myoma. The twentieth United States census shows a record of 657 deaths from myoma in a population of thirty-seven million females. From this the inference is, unless we study further, that uterine myoma is not a disease that causes death in any considerable proportion of instances. The discrepancy, however, between the figures for population and for deaths from myoma will diminish when we consider the ages and social states of the women who have myomata. The prevailing age when the diagnosis is made is from thirty-five to fifty-five. Many more single women are affected than married women. Many more sterile or nearly sterile women are affected than prolific women. Williams hazards the belief that 20 per cent. of all women over thirty-five years old have fibroids. From that assumption he jumps to the conclusion that one million patients in England are affected with fibroid. This is equivalent to saying that ten females in every thirty-six are over thirty-five years old—a preposterous assumption. On what justification stands the original statement that 20 per cent. of all women have fibroids after

thirty-five, no one has shown us. On the other hand, also, the figures, 33 deaths from myomata, do not represent all the damage done by such tumors. Death certificates are notoriously inaccurate upon which to base conclusions as to frequency of diseases. Those cases only are recorded where the myoma was the sole or the prominent cause of death. In an immense number it is probably a more or less remote accessory cause. Peritonitis and sepsis from infection, on account of the fibroid, will be entered under other headings. In cases of carcinoma of the uterus accompanying fibroid of that organ the death will almost always be entered as due to the malignant disease. We also leave out of account those cases of heart disorder accompanying or bearing a casual relation to fibromyoma, which must in many instances be more or less close accessory causes of death.

It may be doubted whether 20 per cent. of all women over thirty-five have fibroids but it is certain that a very large number have them without symptoms. Autopsies after death from other causes frequently find large or small fibromyomata and operations upon the uterus or pelvic organs often reveal small fibroids which had been causing no appreciable symptoms. Such, however, are not the fibroids which are diagnosed as fibroids. When a pelvic examination reveals a fibroid, it almost always happens that the woman came for such examination because of symptoms and these symptoms usually have been caused by the presence of the fibroid.

From the statistics of McDonald, Noble, A. Martin, Frederick, Hunner, Scharlieb and Haultain, I gather that, out of 1,518 cases of fibromyoma of the uterus observed, 72 were accompanied by malignant disease of the same uterus. Therefore from these figures we judge that about 4¾ per cent. of fibromyomata of the uterus are associated with malignancy.* This percentage, then, is the contribution which the chance of malignancy alone makes to the indications for operation in fibroids.

*Author	Cases	Sarcoma.	Adeno-carc. of body.	Carc. cervix.	Chorio. Epith. Malig.	Total
McDonald	280	3	6	2	1	12
Noble	278	2	7	4	1	14
A. Martin	205	6	7	2		15
Frederick	125	2	6	2		10
Hunner	100	2	3	2		7
Scharlieb	100	6	3			9
Haultain	400	1		4		5
	1,518	22	32	16	2	72
Percentages		1.45	2.11	1.05	0.01	4.62

Klein advised extirpation of the uterus when the fibromyoma continued to grow after the climacterium. He would dare wait only where the tumors were of small size and then only when they were under constant or frequent observation. Most of the best modern authorities are becoming less and less conservative in regard to operation in case of fibroids. Many cases like that of Croisier, already quoted, will appear perfectly benign, but after operation the microscope will prove the existence of the germs of malignancy. The indications for operation on fibroids grow with the improvement of the technique. The smaller the tumor the easier, other things being equal, is the operation. The longer we let a fibroid grow, the harder will it be to remove when we finally decide to operate. The average hysterectomy for fibroids done by the best operators has a mortality at least no greater than 4 per cent. The mortality for the operation in cases of small tumors operated upon when the patient is in good condition, not weakened by repeated losses of blood, not poisoned by long-continued septic absorption, and not mentally depressed by the knowledge for a long time that she was carrying a tumor in her abdomen, must be even much better. For the favorable cases we would expect the mortality of the operation to be little more than for the average laparotomy.

The signs and symptoms showing the actual presence of malignant disease within a fibromyomatous uterus are not quickly distinctive. By the time they have indicated the diagnosis, it is often too late to hope for anything from operation. I would make a working rule that every fibroid of the uterus should be operated upon as soon as the diagnosis is made, except small ones whose only symptoms are the slight discomforts due to their mechanical presence in the pelvis. These should only be excepted when the patient can be under proper surveillance and is willing to undergo examination at intervals of a few months and to report at once upon the occurrence of noticeable symptoms of any kind.

What operation shall be recommended? Shall myomectomy suffice; shall we urge supravaginal amputation or total hysterectomy? If the tumor is small, no larger than a hen's egg; if there are only a few of them, especially if they are near the peritoneal surface, myomectomy will be sufficient, provided that at the same time careful examination of the curetted scrapings under the microscope does not reveal any sign of malignant growth of the endometrium. If the tumor or the affected uterus is larger than one three months pregnant, if hemorrhages have been a prominent

symptom, if the tumor or tumors are near the mucous surface, supravaginal amputation should be done. Under other conditions, total hysterectomy should be the operation of choice. In any event, the tumor, after a myomectomy of the body of the uterus after an amputation, should be opened at the time of the operation and inspected for signs of malignancy. If possible, the freezing microtome should be brought into play by a competent assistant while the pelvic toilet is being made. On any suspicion, the rest of the uterus or the cervix should also be removed. Haultain says that a fibroid in the pelvis is worth two in the museum. I am inclined to think that a uterus under suspicion of malignancy is in its best situation when placed in a jar.

A specimen in my possession is a uterus affected with fibroids and with adenocarcinoma of the endometrium of the body. So far, microscopic examination has not revealed any extensions of the carcinoma into the fibroid. There is also chronic salpingitis of both tubes, with numerous and extensive adhesions. The patient was a widow, who entered my service in the Cook County Hospital with a diagnosis made in the examining room of incomplete abortion. She was 45 years old, and had recently passed the menopause. She denied pregnancy but admitted the possibility. Bimanual examination showed the presence of the enlarged and hardened tubes, and an enlarged uterus. The external os was patulous and through it one could feel a soft velvety lining to the uterus. I made a diagnosis of probable multiple subserous fibroids, and possible retention of decidua and secundines after abortion. There had been several rather free hemorrhages for the past few days but none before that since the cessation of the menses several months previously. This history spoke also for incomplete abortion. I explained to the patient that we would give her ether and do whatever operation then seemed advisable. She gave her full consent. Under anesthesia, the nodular feeling of the body of the enlarged uterus and the hardened tubes gave a typical appearance of multiple fibroids and I did a laparotomy, without any vaginal operation, giving up all idea of incomplete abortion. I found a uterus matted in the pelvis and adherent to the tubes, ovaries and much of the pelvic wall and not a little to the rectum. I did a supravaginal amputation, leaving the cervix because it appeared normal and I had no suspicion of malignant disease of the endometrium. The specimen was opened in the laboratory later and the endometrium proved to be extensively affected with adenocarcinoma, which had extended in

several places to the wall. Therefore, one week later I removed the cervix by vaginal operation. No carcinoma has been found in the cervix. The patient made a good recovery and left the hospital about two months later, with no trace of recurrence.

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PERINEORRHAPHY BY UNITING THE BORDERS OF THE LEVATOR ANI MUSCLES.

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(With three plates)

Approximation of the borders of the levator ani muscles in perineorrhaphy was advocated by Dr. C. P. Noble in 1897,[1] and the principle has since been employed in different ways by a number of operators. In many cases of extreme relaxation of the vaginal outlet associated with rectocele, simply suturing the borders of the muscles together in the median line gives excellent results.

If the muscles are exposed by lifting a flap from the posterior surface of the vagina, are laid bare by dissection, and are then united by buried sutures, there are certain objections to the operation. Hemorrhage is hard to control, and dead space is likely to result. Buried sutures in perineal work are undesirable, as they predispose to infection.

To obviate these objectionable features I have devised the following technique, the steps of which are well shown in Mr. Horn's drawings. While this same technique may have been employed by some one else, I never saw it used before, nor have I found it described in the literature.

The area of denudation is triangular in shape on the vaginal surface, the apex of the triangle being from 4 to 6 centimeters from the outlet in the median line. From this point the denudation runs out to the lower part of the remains of the hymen, the upper and outer lateral limit being about the same as in the

[1] *Am. Gyn. and Obst. Jour.*, April, 1897.

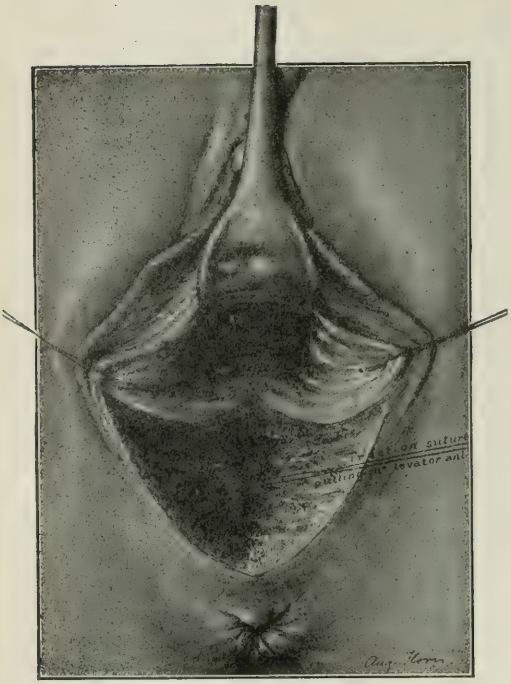


Fig. I.—Denudation completed. The temporary suture has been passed through the levator ani on the left, and traction on the suture makes the muscle stand out.

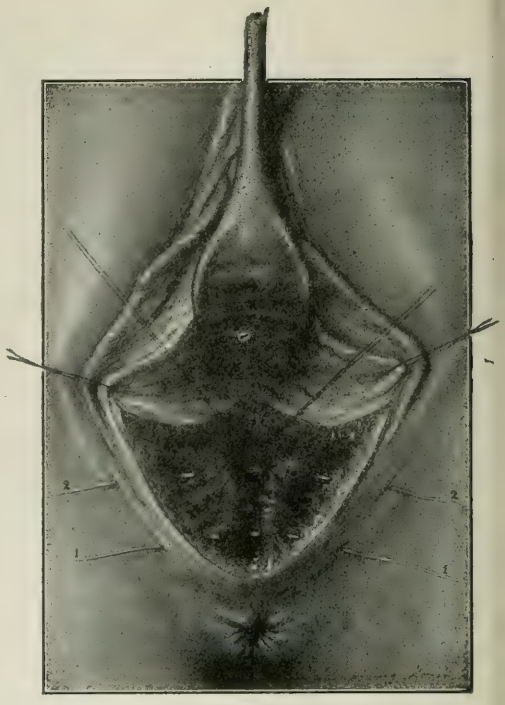


Fig. II.—The external silkworm gut sutures (1 and 2) have been introduced. These sutures pass through skin, subcutaneous tissue, and levator ani on each side. The muscles are made prominent by the temporary silk traction suture.

Emmet operation. The external denudation is brought down to a point which is usually just above the position of the spincter ani. The limits of the denudation are first marked out with the knife, then the vaginal mucosa is removed with the Emmet scissors.

The border of the levator ani muscle on one side is now felt by palpation with the finger just behind the ischiopubic ramus.

Under guidance of the palpating finger this broad edge of muscle is seized with the mousetooth dissecting forceps through the overlying fascia and connective tissue and drawn out toward the median line. A round needle bearing a silk suture transfixes the fascia and muscle. The suture is not tied. The ends are clamped, and it is used to draw the muscle forward and make it prominent when later in the operation it is necessary to pass

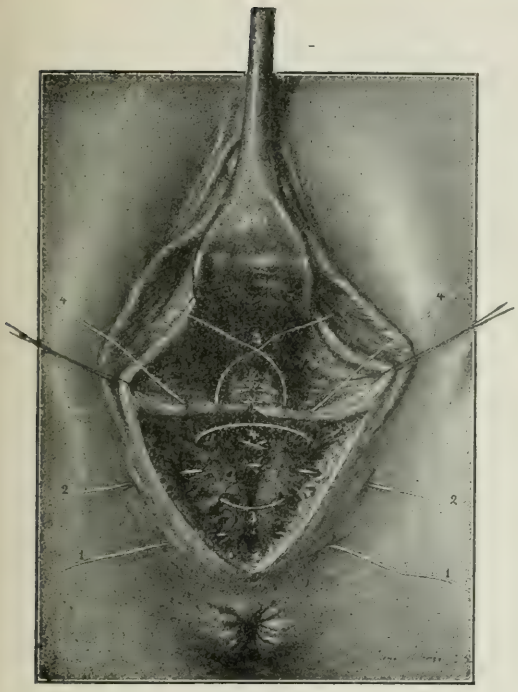


Fig. III.—Three internal stitches, approximating mucosa, have been placed and tied. The two formalin catgut figure-of-eight sutures (3 and 4) have been placed, and are ready to tie. They pass through mucosa and muscle. The temporary traction sutures through the muscles are no longer necessary and have been removed.



Fig. IV.—Both figure-of-eight sutures have been tied. The muscles are closely united to one another. The cut edge of the mucosa is united internally. The mucosa is drawn down to the muscles behind, and the only suture seen is the long ends of the last figure-of-eight suture (4) which have not yet been cut.

sutures through the muscle. A second suture is next passed through the muscle of the opposite side in a similar manner.

The denudation of vaginal mucosa should of course extend high enough on the lateral walls of the vagina to allow the muscles to be brought together easily in the median line.

Two external sutures of silkworm gut are now introduced, as shown in Fig. II. Each suture passes first through skin and subcutaneous tissue, through the levator ani on the same side, then through the opposite muscle from before backward, and finally out through the skin and subcutaneous tissue on that side. When the needle is passed through the levator ani an assistant pulls on the silk traction suture which has previously been passed

through the muscle, making it stand out, and a deep bite can be taken, passing through the entire muscle.

The lowest suture is put near the rectum, the left forefinger of the operator pushing the rectum down so that it is not injured. The second suture is placed about 2 centimeters above the first suture. When these two sutures are drawn tight the borders of the two muscles are closely approximated as are also the edges of the skin incision. The muscles are also held firmly against the skin and subcutaneous tissue.

The silkworm gut sutures are not tied until after the internal stitches are placed and tied. The temporary traction sutures through the muscles may now be removed if desired, as the muscles are well splinted out and rendered sufficiently prominent by the silkworm gut sutures. The first internal stitches are of plain catgut and begin at the apex of the triangle. Three or four stitches are usually taken, uniting the cut edges of the mucosa and catching enough of the denuded surface between to prevent leaving any dead space and to stop all bleeding.

The figure-of-eight stitch which is next placed is best understood by referring to the drawing. (See Fig. III.)

Formalin or chromic catgut is used. The stitch starts on the right-hand side, passes through mucosa and underlying tissue to the posterior surface of the muscle. Without touching the muscle of that side it is carried to the opposite side and pierces that muscle from behind forward. Then it passes to the anterior surface of the muscle on the first side and passes through that from before backward. Finally passing to the second side it is brought out through the mucosa and underlying tissue in the same way as it entered on the first side. Two such stitches are inserted. The first one pierces the muscles between the two silkworm gut sutures, the second goes through the muscles above the uppermorst silkworm gut stitch.

By tying these two figure-of-eight sutures the borders of the levator ani muscles are brought together, the cut edges of the vaginal mucosa are nicely approximated, and the mucosa as a whole is bound down firmly to the posterior surface of the muscles. A muscular wall is built up, the posterior portion covered with mucosa, the anterior surface is as yet bare.

By tying the silkworm gut sutures the anterior part of the muscular perineal wall is covered by skin and subcutaneous tissue, the muscles are still more closely approximated and are firmly bound to their covering of subcutaneous tissue and skin in front. One

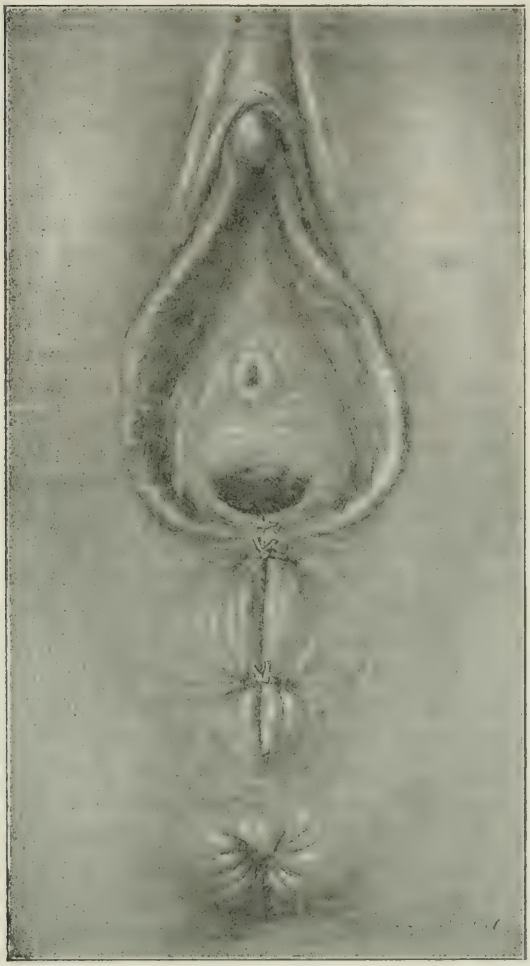


Fig. V.—Silkworm gut sutures tied. Operation completed. A superficial catgut stitch has been placed above the upper silkworm gut suture to approximate the skin. The labia are drawn aside to show the size of the outlet left.

or two superficial stitches of plain catgut are sometimes necessary to approximate the skin or mucosa at the upper part of the wound.

The advantages of the operation are as follows:

A thick, firm perineal body is built up, which narrows the outlet. As in the Emmet operation, the axis of the outlet is lifted up out of the direction in which the intraabdominal pressure transmitted downward in the upper part of the vagina. A

vaginal sphincter of voluntary muscle is incorporated in the perineal body. The muscles are brought together in front of the rectocele. The rectocele is therefore pushed back and obliterated, not partially incorporated into the perineal body as in the Emmet operation.

On account of the shape of the area denuded a good cosmetic result is obtained, cut edges of skin and vaginal mucosa are everywhere correctly approximated and an even linear scar is left.

By not dissecting the levator ani muscles free from their surrounding fascia the vaginal plexus of veins is not torn, and when the sutures are tied no dead space is left and hemorrhage is well controlled. If the edges of the muscles are laid bare and they are pulled forward out of their fascia and united in the median line, it is almost impossible to avoid dead space, and bleeding is often hard to control.

The perineal body which is formed is made of three layers, vaginal mucosa and submucosa internally, muscle in the center, skin and subcutaneous tissue externally. Not only is each lateral half of each layer accurately approximated and firmly bound to its corresponding half (*i.e.*, muscle to muscle; mucosa to mucosa; etc.), but also the three layers are bound so firmly together in an antero-posterior direction that they form one mass of tissue with no dead space in it. This is all accomplished by the four sutures which pass through the muscle, none of which are buried. No suture is so introduced that strangulation of muscle fiber can result when it is tied. The temporary traction suture passed through the muscle at the beginning of the operation is very useful. It is easy to pass the silkworm gut sutures deeply through the muscle when it is made prominent by this traction suture.

The operation is comparatively simple and easy. But seven or eight sutures are used as a rule. If proper care is taken the rectum is never in danger of being injured.

I have used this method in about twenty cases with uniformly good results. The silkworm gut sutures are removed on the twelfth day. No breaking down has occurred in any case. In one case there was a complete tear extending three centimeters up the bowel. After suturing the bowel and uniting the sphincter, the levator ani muscles were sutured together in this way. The final result was most satisfactory.

On discharge these patients have a strong vaginal sphincter.

Upon getting them to contract their muscles, the examining finger in the vagina can feel the contractions of the muscle in the perineal body. In cases examined six months after operation the result was as satisfactory as at discharge, the vaginal sphincter still being present.

THE DIAGNOSIS AND TREATMENT OF PNEUMONIA IN CHILDREN.*

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THIS subject has been chosen by me because during the past winter I have seen cases of pneumonia in which the diagnosis was obscure in the beginning of the attack, and it was only after careful examination and strict attention to symptoms that a correct one was possible. I have also seen some cases in consultation which I thought were overtreated, and others where harm had resulted from hygienic conditions having been neglected.

I shall first consider the diagnosis of bronchopneumonia and lobar pneumonia and then their treatment.

During an attack of bronchitis the fever at times becomes higher and irregular, 101°–103° F., the respiration 50-80 per minute and pulse rapid. These symptoms with some cyanosis and an expiratory grunt will point to a bronchopneumonia having developed. There are also a dry, irritating cough, marked nervous symptoms, and usually severe prostration. It is not always easy to find the patch of consolidation, but if the lungs are gone over carefully a spot of rough breathing with fine râles will be detected. When a child is very nervous and refuses to submit to an examination we must often make a diagnosis from the temperature, respiration, and general appearance. Very light percussion is necessary in children on account of the thin chest walls. Auscultation is a greater aid in the diagnosis, revealing at first small mucous and then subcrepitant râles with bronchial breathing. These areas vary from day to day, being marked in one spot at one time and afterward in another. The large râles of bronchitis are also present. There is no constant germ in this disease, but in 50 per cent. of the primary cases the pneumo-

* Read before the Washington Obstetrical and Gynecological Society, April 7, 1905.

coccus is found either alone or in conjunction with other germs most commonly streptococci. Next in frequency comes the staphylococcus and the influenza bacillus.

Lobar pneumonia was formerly thought to be a rare disease in young children, but it is now known that it is often found in them. It is of frequent occurrence in infants, but is often overlooked. Out of 15 cases of lobar pneumonia treated in the children's Hospital this winter 7 were between 1 and 2 years of age, and 4 were 3 years old. The disease differs in some respects from its appearance in adults, as the temperature curve is not so definite or well marked. It runs a more regular course than in bronchopneumonia, and unless the lungs are much involved the dyspnea which is found in the latter disease is absent. There are also fewer râles present. Cough is not a prominent symptom, and expectoration is seldom seen. Several years ago I saw in consultation a young girl whose temperature for some days had been 102° to 103° F., and she had a furred tongue, lack of appetite, constipation and a slight headache. There was no cough or pain about the chest. The symptoms pointed to typhoid fever. On examination of the chest there was dullness on percussion over the left lung, anteriorly and posteriorly (upper part), with bronchial breathing and bronchophony. The patient made a good recovery without any cough or expectoration during the course of the disease. In this case without an examination of the lungs a correct diagnosis could not have been made, as the child did not have any symptoms such as cough, expectoration or pain to call attention to the grave lesion in the lung.

The onset of the disease is usually sudden, and in common with all maladies which begin abruptly, the symptoms are usually nervous and gastrointestinal. This winter I was in consultation in the case of an infant 22 months of age, who for a week had severe gastrointestinal symptoms with an intermittent temperature 99° to 104° F. and rapid pulse. The child was very nervous, but had no cough. The abdomen was tympanitic, and there were frequent small loose mucous stools with much pain. A careful examination of the lungs revealed a small spot of bronchial breathing at the angle of the left scapula. For some days the temperature remained at 103° to 104° F., and the entire upper lobe of the left lung became involved. Crisis occurred on the fifth day. It is not always easy to recognize pneumonia at first in an infant because many of the symptoms lead one to suspect inflammation of the meninges or one of the eruptive diseases.

If the process commences in the interior of the lung or near the spine it may be some days before the physical signs are such that one can be certain of the diagnosis. Often when the apex is affected it is only by examination in the axillary region that the condition can be detected. The second pulmonary sound, if markedly accentuated, should be considered sufficient reason to suspect an abnormal condition of the heart or lungs. It should be kept in mind that this pneumonia is often complicated with pleurisy and sometimes with pericarditis.

In atypical pneumonia and in vague affections where the diagnosis is otherwise difficult or impossible blood cultures are of great value, and will often make the differential diagnosis. Edward C. Rosenow (*Jour. Amer. Med. Assn.*, March 18) says in regard to the blood in lobar pneumonia that the pneumococcus can be isolated from the blood of pneumonia patients in about 90 per cent. of all cases and that pneumococci in the blood may be demonstrated, not infrequently before the advent of typical physical signs. They tend to disappear at or about the crisis and are usually absent after it. Other things being equal, a high leucocyte count is a favorable sign. It seems probable that the pneumococcus, by its growth in the consolidated lung and in the blood of the patient during life, produces acids as it does in the test tube, and that some of the symptoms of pneumonia are due to this acid intoxication. If this is a fact it would probably be well to follow the practice that has recently been adopted by Billings of giving pneumonia patients large and repeated doses of bicarbonate of soda.

The urine should be carefully examined for chlorides, for the absence or considerable reduction of these is a diagnostic sign of great value in a doubtful case, as it has been found that in typhoid fever and tuberculosis the reduction is comparatively insignificant (Joseph Sailer). Cases of bronchitis in children should receive careful attention and nursing, so as to prevent bronchopneumonia from developing, and when it does occur the patient should be isolated in order to prevent contagion. Much depends on good nursing, and this includes ventilation and proper temperature of the room—68°–70° F. The patient with this disease, the same as those suffering from other diseases of the lungs, should have a large amount of fresh air. Many (this includes some physicians) appear to consider it a sin to allow any fresh air in the sick room, but think that the little one must be kept in a hot, close room with woolen goods or cotton

jacket about the chest. In a case in which I was a consultant this winter, the infant was in a room 15 by 17 feet. There were four persons present and a large gas stove helped to heat the room. The temperature was about 80° F. and the windows were closed. The little patient was enveloped in heavy clothing. There was marked respiratory dyspnea and cyanosis. The child was dying for want of fresh air. The physician in charge was a capable man, and he explained to me that it was impossible to get the parents to observe the proper hygienic measures. The diet is of the greatest importance, for the digestive organs must be kept in good condition. If the temperature of the child is high, sponging with cool or tepid water will allay the nervous symptoms and promote rest. Small doses of the sweet spirits of niter or solution of acetate of ammonia (if neutral) will have a good effect on the fever, but the coal-tar preparations must not be used for this purpose. Expectorant medicines are not of any, or are of little, value in the disease, but often impair the digestion. The carbonate of ammonia and aromatic spirits of ammonia are at times useful as respiratory stimulants. Alcohol and strychnine will be necessary in many cases when the vital forces are on the wane. If the cough is harsh and dry the air should be kept in a moist state and the croup kettle (with compound tincture of benzoin in the water) is admirable for this purpose. I do not recommend the vapo-cresolin lamp, for I believe that I have seen in several cases injurious effects from its use. Unless the cough is very troublesome it does not require treatment, and certainly one must be cautious in the use of opium, for if given to relieve cough it interferes with the secretions and embarrasses the respiration. It is necessary for the patient to cough to remove the mucus from the bronchial tubes. A teaspoonful of hot water will often have the effect of quieting the cough. A mild mustard plaster is often of service. The chest can be rubbed with camphorated oil or Roche's embrocation, this latter being a favorite application with me. It is a fad at the present time to apply clay preparations to all the ailments of the body; yet, as I have seen blisters produced by the application of one of these on several infants, I would warn against their use—I have never noted any good from them in cases of pneumonia.

The heart's action and the skin must be watched, and if the former shows signs of fatigue or the latter any cyanosis, increased stimulation must be resorted to and warm mustard baths and dry cups may be employed.

Beverly Robinson, who has paid considerable attention to the prevention of pneumonia, has observed that the micrococcus lancelatus is one of the least tenacious of life among the pathogenic microorganisms, and that it does not thrive in an acid medium; therefore, he recommends the frequent use of acid mouth washes in times when the disease is prevailing. The sputum, stools and urine of the patient should be destroyed and the mouth washed frequently with an antiseptic solution. The antipneumococcal sera have not been found to have any marked benefit, though some have thought that there has been a slight reduction in the mortality shown. Even those who have given the serum in large doses have not been able to report any great success. One of the prime factors in the treatment of pneumonia is to watch the condition of the stomach and bowels, for in nearly every case there is great disturbance of these organs. The food must be such as will be easily digested and cause no fermentation. If the stomach and bowels keep in good condition, the battle is half won. Milk should be diluted and not given in too large amount at a time. The child should be fed at regular intervals, and plenty of good water given. The bowels should be opened at the commencement of the disease with castor oil or calomel and afterwards kept open by enemata. The hygiene of the sick room should receive careful attention, for the child requires all the fresh air that can be introduced into the room. We are much indebted to William P. Northrup for having kept before the profession the method of the fresh-air treatment of pneumonia, and I believe if generally adopted it no doubt will do much to reduce the mortality of the disease. We are all acquainted with the old treatment of pneumonia, the patient being kept in a room where no fresh air was admitted on account of fear of drafts, and enveloped in a heavy, oilsilk lined pneumonia jacket, keeping the sick one in a constant perspiration and uncomfortable condition. This tends to weaken the action of the heart.

If the fever is high, the same therapeutic measures which were advised in the treatment of bronchopneumonia are indicated in this disease. The heart should be frequently examined, and if there is weakness in its action strychnine and digitalis can be given. Yet these must be employed with caution as harm can be done by over-stimulation. I do not resort to alcohol in many cases because it often has a bad effect on the brain, but at times it is of great service. The aromatic spirits

ammonia can be substituted for it with advantage in some cases. The inhalation of oxygen, which is so often employed in this affection, has never in my hands saved any case from death, yet I think that it does much good as a respiratory excitant. If it is expected to accomplish marked benefit, it should be used early in the disease and not when the patient is almost in a morabund condition.

For several years I have not had a penumonia jacket put on a patient, as I came to the conclusion that it interfered with the already embarrassed respiration. If there is much pain due to pleurisy an ice-bag can be used. If there is a pleural effusion paracentesis is indicated, and empyema demands surgical intervention.

During the past winter there were 15 cases of lobar pneumonia treated in the children's hospital without a death; 7 of these were from 1 to 2½ years of age; 4 were 3 years of age; 3 from 4 to 6 years and one 12 years old. Eight were white and 7 colored; 8 were of the female and 7 of the male sex; 11 of the cases terminted by crisis and 4 by lysis. The left lung, and especially the upper lobe, was affected in 10 cases. These cases were treated by the open-air method, light diet, small doses of strychnine, and carbonate of ammonia, as required by the symptoms.

MAUQUEST DE LA MOTTE AND HIS TREATISE ON OBSTETRICS.

BY

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THE work on obstetrics by Mauquest de la Motte is a fine example of what a man, isolated in a small provincial town, can do when he possesses a penetrating and ingenious mind, and knows how to observe and remember. The book, unlike almost all of any value which appeared at this time, was not composed at Paris, but was written in a little town of Picardy, at Valognes, in a district which, according to its author, is isolated on nearly every side by the sea. In a thesis upheld at Paris some twelve years ago, the name of whose author I cannot recall, I found an extract from the register of civil states for the year 1655 of the city

of Valognes, the birth certificate of de la Motte, which runs as follows:

"Guillaume, fils de messir Mosquet et de Julienne Robiolle, a été baptisé par M. Charles Gouïl, prêtre, vicaire de Vallognes et nommé par moi, Guillaume Besnard, bourgeois et marchand, du dit Vallognes, assisté de Jeanne Mosquet. Ce 19 fev. 1655."

De la Motte's father appears to have belonged to the good class of Valognes and to have been well-to-do. At any rate, he possessed all that was necessary to carry his son through his surgical studies. The latter entered in the first place as an externe at the Hôtel-Dieu and later became a "garçon chirurgien."

He was able to enter the obstetrical service at this hospital, which was so inaccessible to students, only by a ruse to which he alludes in his work. De la Motte is careful to tell us that the reputation of this service, considering the teaching that one could obtain there, was extremely exaggerated, no matter what Mauriceau and Peu might have said. The following quotation from his book related to his stay at the Hôtel-Dieu, and is interesting in several respects: "It seems, from reading the works of MM. Mauriceau and Peu, that it is impossible to succeed in the practice of deliveries unless one has worked in Paris, at the Hôtel-Dieu. It is true that this hospital is the best school for surgeons in Europe, and that I ardently hoped to have been able to be admitted to the operations of delivery during the five years that I worked in this building. But as there was only one surgeon usually who was charged with this function, and as it is a place which is given only by favor, I was obliged to content myself with following, in the position of topique, (the assistant, who followed the physician on his rounds and who wrote the prescriptions ordered for the patients) the physicians who visited for two months of the year, so that I followed for six months only three of these physicians, who were MM. de Bourges, Ozon, and Morin, during which time I devoted myself to examining the conduct of these gentlemen in guaranteeing the parturient against the accidents which occurred after their delivery. I recompensed myself to some extent by this means for my lack of recommendation, but I am sure that during the six months that I was admitted in this quality there was no extraordinary labor save that of a child which was enclosed in the passage, in which the presence of the surgeon was necessary, and which terminated, however, without other recourse than that of patience, although there were during

that time 350-400 pregnant women who were all delivered by apprentices, and rarely by Mme. de la Marche, then chief midwife of this hospital. She persuades me that these authors lived in a very different period from mine, and that they greatly exaggerated in counting by hundreds the deliveries that they said they had conducted."

De la Motte, having no friends in Paris, had no intention of remaining there, whose narrow and filthy streets could have no attraction for a man brought up in the country. He returned to Valognes to practice, and was not long in acquiring a great reputation, both as a surgeon and an obstetrician, as may be seen from the following passage from his work on obstetrics. His horror of the crotchet is also evident, and he contributed greatly towards its disuse. "However, though I have not had the good fortune to practice in the Hôtel-Dieu, Heaven has not ceased to bless my work, and joining reading with practice, observations with reading, and reflection with observations, I have not failed to acquire in a short time more reputation than I could expect, having often conducted up to three or four deliveries in a day, and I may say happily, in whatever situation the children were placed, without the aid of the crotchet, or of any instrument whose effect is to be feared."

De la Motte was most charitably inclined and was liked by everybody, although he was extremely independent. He not only delivered peasants and other country folk, but ladies of quality sent for him from afar. He also had a well-stocked wine cellar, as he himself tells us, which gave him recreation from time to time after the preoccupation and fatigue that his large practice gave him. It is to be hoped that the accident to his wine of the kind of which he speaks when discoursing on menstruation did not happen very often. The paragraph to which I refer is as follows: "I see daily girls and women who go about and do everything while they are flowing, without causing pestilence or injury. But I see also those whose presence is to be feared when they are in this condition, especially red-haired ones. I had a servant of this kind. One day, when I was giving a breakfast to several of my friends, she went to draw a white wine that they found excellent. The next day, finding myself at breakfast with one of those who had been at my house and who had no white wine, I sent to fetch some of mine. But it was so spoiled that no one could drink it, and could only be used by me to make vinegar. This same

servant assisted, some time later, in curing a piece of pork; this piece was spoiled, and the other, which was cured by another person, was very good."

The two great events in the quiet life of de la Motte were the publication of his treatise on surgery and of his work on obstetrics. He was quite old at the time they appeared since he had been in practice for more than forty years, but he was well rewarded for his work, because his reputation soon extended throughout France and his name has remained as a classic, while many of his contemporaries who, at the time, were far more illustrious, have fallen into the most profound oblivion. He died at the age of 82 years, after an active life, and I here append the record of his death, taken from the same source as that of his birth:

"Guillaume Mauquest, sieur de la Motte, chirurgien à Vallognes, décédé du jour d'hier, âgé de quatre-vingt deux ans, a été inhumé dans l'église Saint-Malo de Vallognes par messire Louys-François de Bernières de Sainte-Honorine, licentié aux lois, syndic du clergé paroissial de Vallognes, grand vicaire de monseigneur de Coutance, assisté de tout le clergé en présence des soussignez le vingt-quatre décembre 1737. Sont signés au registre; La Motte Mauquest, Frigot, L.—Fr. de Berniéres."

The treatise on obstetrics by de la Motte is constructed on the same plan as that followed by Portal, namely, it is, above all, a collection of cases. These are, however, very numerous, very well chosen, and relate only to subjects which are of interest to the practitioner. There are more than 250, and they are preceded by a short introduction on those points which they serve to illustrate, and in order to make them still more useful the author adds some interesting remarks.

I shall give only a short analysis of this work, but I would add that de la Motte wrote it with great independence of character and put forward only what he thought to be the truth, and that he had controlled himself. I here give a translation of what he says concerning this: "As I live at the tip end of a province bounded on nearly every side by the sea, and as I usually work in the country, without physicians or surgeons who might aid me with their advice, or who, at least, are very rarely to be found, I have been obliged to conduct myself usually in endeavoring to aid Nature and to control the accidents which accompany pregnancy and labor, all the more so that good sense and my reflections have

furnished me with the means, without submitting me too much to the authorities nor rendering me a slave to the customs generally received, unless I recognize the necessity of conforming myself to them, on account of the disease, the constitution of patients, and other circumstances from which one may draw certain considerations."

De la Motte has said little relative to the pelvis. "But as this cavity (pelvis), formed by the assemblage of several bones, often presents obstacles to the exit of the fetus, it is well to know its structure in the normal state in order to readily perceive the greatness of the difficulties which are met with in labor." He speaks of difficult labors resulting from narrow pelves, but he gives no complete description, and does not even devote a single special paragraph to it. His description of the anatomy of the soft parts is found in a chapter which has been compiled from good authors and is written methodically. I would, however, point out that he admits that the hymen, on which so many divergent ideas still reigned, exists. The numerous quarrels which resulted on account of this small membrane had not ended in de la Motte's time. In his treatise on anatomy Dionis remarks that, with all the trouble that he took to find this membrane, he had never seen one, although he had performed autopsies on girls of all ages. Mauriceau was of the same opinion, but de la Motte did not agree upon this point, as the following paragraph shows. "One notices a membranous circle which is called the hymen, and is only to be found in virgins." He then points out that when ruptured four or five granular masses develop to which the name of caroncules myrtiformes has been given. There is nothing to note in his description of the uterus and, as to the ovaries, he appears to adopt Graaf's opinion, but without being categorical, for he says that "in its substance one notices round vesicles more or less numerous, according to the age and the temperament. They are filled with fluid similar to the white of egg."

The chapter treating of menstruation is one of the most curious of the work, and after having recalled in a few words the way most authorities have treated this physiological function, de la Motte takes up the question in the first place by combating the erroneous ideas of his time and then points out the anomalies of the function. He energetically denies the influence of the moon on the menses, and says that he has never been able to find in all the experiments that he undertook, both in women who had their

menstruation and those he had delivered, that the moon played any part; and he also says that the majority of people pretend that labor depends on the time of the moon as well as that women have their monthlies according to this maxim: Luna vetus vetulos, juvenes nova luna repurgat. "To prove what I uphold one has only to note what takes place in a community of girls, or to see as many women as I do daily. Far from finding that they all have their monthlies at the same time, that they flow to the same quantity and as many days alike, one will find that in this matter they are all different, and that there will not be two who, under these conditions, are alike if they are carefully observed. But, on the contrary, I have always noticed that when I have been consulted in this kind of thing, in every stage of the moon, that some of these girls had their monthlies as well during the interval of the increase, during the full moon, and the other quarters as well as in the commencement of any one of these times. The same applies to labor; there are no days in the year when some confinements do not take place."

De la Motte mentions some cases of precocious menstruation, which are quite interesting: "The time (13 to 14 years of age) is nevertheless not absolutely fixed, because I have seen several in whom this evacuation took place regularly after the age of 9 years, and I bled two at the age of 11 years from the arm and foot, in which I had employed all the remedies most apt to bring about the return of blood, having experienced all the most unfortunate symptoms that suppression may cause. I have even seen and treated a small girl three years old, in whom there appeared for several months, and at nearly equal intervals, signs of blood, whose suppression caused her to have a nose bleed almost periodically, which lasted several days, and was cured by bleeding from the arm, mild purgatives and a regimen that I made her follow with as much exactitude as her great youth would allow. . . . I have seen a woman in whom this evacuation ceased at the age of 34 years, without ever having suffered any bad effects, and I saw another who had had thirty-two children at 45 years of age, which was the date of her husband's death, and who still had her monthlies at the age of 61 years, when she died, having menstruated as regularly as she did at the age of 25."

In the fourth chapter of the book, de la Motte studies the causes of sterility, and admits five principal ones, namely, impotency on the part of the man, derangements of menstruation,

malformations, disproportion between the genital organs of the husband and wife, and the temperaments. A series of observations prove that impotency may be due to an incomplete erection, to an erection and too rapid ejaculation, the large size of the penis, epispadias, paraphimosis, etc. As to the difference in temperament they all belong to those cases where, in all probability, one was dealing with an infantile uterus, or some malposition which our author, being unable to recognize, considered as some vicious condition of the temperament, a most excellent expression from the mere fact of its great ambiguity.

De la Motte distinguishes three kinds of pregnancy, namely, normal, pathologic and false. These definitions and divisions are found in most of the writers of this time, in Peu, for example. It is well-known that a false pregnancy is the result of hysteria and pathologic pregnancy merely refers to hydatiform mole. "Although these three kinds of pregnancies give rise to similar symptoms at their beginning, a long experience alone will allow one to recognize the difference; but never so certainly but that old physicians, and consequently the most distinguished surgeons, are occasionally led into error and fall into the mistakes of which they have reason to repent, as all authors who have written on obstetrics admit."

Consequently de la Motte recommends very great reserve in all these cases. A great number of symptoms are the same in different pregnancies, but there are, however, certain shades. For example, the development of the abdomen is more rapid in a pathologic pregnancy and slower in the true; there is often a sinking in of the belly, which has given rise to the proverb "ventre plat, enfant il y a."

The movements of the child are also of great importance and occur "the earliest at forty days, and at the latest from 4 1-2 to 5 months. Nevertheless, the diagnosis during the early part is always difficult." In spite of all these symptoms, he points out that a surgeon should always be very reserved when it is necessary to decide, there being no rule, however general, which does not have its exception, as he shows by a certain number of cases where the menstruation had continued during pregnancy and by others where the patient never felt life.

Some of the passages relate to diseases of pregnancy, the first of which is vomiting. "This sympathy between the womb and stomach is so sensitive and so evident in some women that it is

not even necessary that they be pregnant to feel its effects, since the mere action of coitus produces vomiting. . . . This near relationship existing between the stomach and the womb does not always produce the same effect, but only in some women, because there are a quantity of others who are one month, six weeks and even two months pregnant who do not vomit." Further on he says that there are many women who only vomit after the fourth or fifth month, and he mentions cases of women greatly reduced in strength by continual vomiting, that a single bleeding was sufficient to cure. As to cough during pregnancy, he says: "Cough is one of the most unfortunate symptoms with which a pregnant woman can be attacked, because it places her in danger of being delivered before term by the unfortunate shaking that it gives to the chest and consequently to the viscera of the lower abdomen," and farther on, speaking of certain violent attacks of coughing, which greatly disturb the patient, he says, "These unfortunate coughs are often even followed by vomiting of blood, and sometimes by enormous losses of blood, which result from a more or less considerable detachment of the placenta, and oblige us to deliver the woman in order to save her life and that of the child, if possible."

A very good description of dysuria is given, as well as of complete suppression of the urine and a desire to frequently empty the bladder, all of which our author believes are due to acrid and heated humors or by the descent of the child towards the vagina, which indicates that labor is not far off, and several cases confirming this point of view are related.

As to the position of the fetus, de la Motte opposes the then reigning ideas, perhaps somewhat too strongly, but he rightly shows that during the first months of pregnancy, the fetus is so small that it can assume almost any position; later on the case is not quite the same, because, as soon as it reaches a certain size, all will depend upon the resistance offered by the uterus, as well as its capacity. He goes on to say that besides the movements of the entire child, partial movements are much more frequent, such, for instance, as those of the arms and legs. He thinks that the child changes the presentation each time that he feels the need to do so, and he believes that the spirals of the cord have a great influence on the changes of position, or, on the other hand, on maintaining it.

De la Motte considers a normal labor one which requires no

interference on the part of the surgeon, contrary to the Hippocratic teachings, and he says that a foot or breech presentation can end spontaneously. The reports of his cases of breech presentation give an excellent idea of this condition, but I would point out that in one of these, where the breech would not come down, he successfully extracted the child, but the latter had died during labor.

He also describes a case of knee presentation, in which he successfully extracted the legs and drew the child down easily into the pelvic excavation. When the child presented by a single foot, he thought that one should search for the other lower limb. Version had taught him that foot presentations, with few exceptions, are quite as normal as head presentations, and that labor in the former may be accomplished much more rapidly, and that by using precaution one may easily avoid any accidents. He also thought that twin pregnancy should be considered as normal. Face presentations are only difficult when the child is at term, and he had met with these in premature labors which ended without any difficulty, and two cases that he relates demonstrate that even large children may be born without serious trouble. He also records two neck presentations, and says that he is fearful of ear presentations, which, at the present time, are so easily remedied by the use of the forceps. Neck presentations, if they do not become spontaneously reduced, necessitate version. He met with one back presentation and one of the abdomen, and in another case, where the head, one foot, and both arms had become engaged, he was successful in performing version. As I have already pointed, de la Motte was absolutely hostile to the use of the crotchet, as the following quotation will show:

"I say without recourse to the crotchet, having myself used it only twice in more than thirty years; no matter what may have been the difficulties of the labors, I have always substituted other surer means in its place, as I have shown in several of my reported cases, without fear that any surgeon of any city or other places where I have been called to perform all kinds of labors, can say of me what Mauriceau says in the thirty-third chapter of his Grand Livre of a surgeon who bragged of the same thing, and without apprehending that any woman of the kind that I delivered in thirty or forty towns of the country has suffered the slightest inconvenience after her labor, that could be attributed to bad operating. All of which shows clearly that my practice is not only

the simplest, but also the least painful, the least cruel, and the surest that one may put into use." And further on he says, "it is true that I condemn surgeons who, much to the shame of the art that we practice, have only avarice as a guide and a gross ignorance as partakers in the profession that they exercise as obstetricians. These people are greatly to be feared when women have unfortunate labors, because having nothing else to offer them than the crotchet, in the deplorable situation in which they find themselves, they use it indifferently in any position that the child may present."

Relative to the Cesarean operation, de la Motte expresses himself as follows: "Although I have never undertaken the Cesarean operation upon any occasion, it is not because M. Mauriceau absolutely condemns it and that M. Peu does not advise it, since, in opposition to their idea, the possibility of performing it is sufficiently proven by cases of women who have escaped death after having had it performed, but it is only rarely that one is obliged to undertake it, because the perfection of the art at the present time renders recourse to this operation nearly always useless; however, if some malformation prevented the introduction of the hand, as is related by M. Mauriceau in his twenty-sixth case, I would make no opposition to putting it into practice."

We now come to a consideration of some of his reported cases, the first being the delivery of two children and the great advantage that the mother receives from being delivered of the second. "It is not a necessity that a woman enlarges when she is pregnant with two children. If the unusual size of the abdomen, swollen legs, the difficulty in walking, the equal movements on both sides of the abdomen, and the rest, are not certain indications that a woman is pregnant with two children, it is also not a constant truth that those who are pregnant increase in size more or less in a few days. No matter how much attention I have exercised when examining this kind of pregnancy, I have never noticed anything that cannot be met with in those who are pregnant with only a single child; and when a woman is attacked by these inconveniences, they arise only from the accidents to which all pregnant women are alike subject, as I have remarked several times, and I have opposed the idea of M. M——, who makes it a general rule."

This author referred to advises rupturing the membranes when the first child is extracted, thus giving issue to the amniotic fluid of the second twin when it is in good presentation, in order to

accelerate the labor and to allow it to end naturally, having even reduced the cord and the arms down, as well as malposition of the head, in order to carry out this intention. "My practice is absolutely opposed to this because, far from undertaking the reduction of the parts that I have just mentioned, and piercing the membranes of the second child, so as by emptying the waters to accelerate the labor, I religiously abstain, because I deliver a woman of her second child just the same, although in good position, after having pierced the membranes, as if it was in the worst kind of presentation, unless the sharp, pricking, and vigorous pains end the labor in a minute, as it has happened to me, and as I relate in my cases."

"All appears difficult in the beginning, but when the surgeon is guided by a long practice, he finds means to easily end the most desperate labors and to hasten those which, by their long delay, might give rise to some uneasiness.

"One should not be astonished to see new things, when they are established upon reason, and upheld by a large number of undeniable facts; it would appear that that is all that one can wish for. Thus could one blame that which is founded on such good principles, and approve that which entails as many subsequent risks as what follows would appear to justify?"

The following case is one of dystocia due to a very large head; and, before successfully delivering the child, de la Motte made several vain attempts. Thus he was unsuccessful in version, because the head had become too much engaged and the uterus too tightly contracted on the fetus, as well as in perforation, by removal of several bones of the head, by the crotchet, which he used in cases of extreme necessity. He was obliged to have recourse to a blacksmith's pincers and, in spite of such difficult labor, the woman, greatly to his astonishment, was perfectly well in a few days. "On October 19, of the year 1712, I was asked to go about a half hour's distance from this town to deliver a laborer's wife, who was in labor for three days and the waters had come away. I made a vaginal examination of the woman and found the child in good position, whose head, which was too large, presented at the top of the vagina, without being engaged, and the mother worn out completely by long and continual pains that she had suffered from the beginning of this labor. The meconium came away in large quantities since the day before, and the cord, which came down in front of the head by passing under it, without coming out of the vagina, was cold and did not

beat; these certain evidences of the death of the child allowed entire liberty to work without any regard for it, which made me hope that I might terminate the labor very promptly, seeing the head so far up, not engaged nor forming any obstacle to the introduction of my hand for the purpose of finding the feet. To accomplish my intention, I introduced my hand into the vagina, passed it to the side of the child's head, and pushed it along above its back to the middle of its body without being able to push it further, because the womb was so tightly applied on the remainder of its body that I was obliged to withdraw my hand and insert it by an opposite route by passing it under the sternum, but also unsuccessfully, which obliged me to withdraw it a second time, a third and a fourth, without having been able to reach the feet; so this obstacle, which was so new to me, as nothing like this had ever happened before, obliged me to give up this tentative to resort to that of opening the cranium, which I did with my scissors, which I pushed into the head, and afterwards opened it with the branches of this instrument, in order to enlarge this opening as much as necessary to carry in my fingers, with which I broke several pieces of the parietal bones and made an opening sufficient to empty out the brain; after which I wished to pull down the head with my hand pushed under the skull, as I have done in a number of instances; but when it began to come down and became engaged between the os ischii, sacrum, and pubis, it was found to be wedged in such a way that it was impossible for me to bring it down further, which led me to break away several more pieces, not only of the parietals, but also of the coronal and occipital, still with no success, my hand being always squeezed at the passage, which obliged me to send for a crotchet, that I applied in the cavity of the right ear, which I drew with one hand while the other was applied on the opposite side, so as to preserve the parts from the instrument in case it should slip, as happened, without my being able to advance the head in the vagina. I again introduced the crotchet into one of the orbits with the same precaution and again it lost its hold; I applied it in the orbit and it was no more successful; I took breath, without, however, giving up, although as tired as possible. I sent for the pincers of a blacksmith, who was in the neighborhood of the patient's house, which he uses to hold his shoes in the forge; I engaged the occipital as much as I could in this pincer, with which I drew the head out of the passage, which had resisted everything that I had employed to bring about this result. I seized it at once and did all that I

could to terminate the labor, but I was prevented by the width of the shoulders, which resisted all my efforts quite as much as had the head, which obliged me to give the head to the midwife, whom I told to pull with all her strength, while I inserted my fingers under the arm pits, in order to draw on them, to bring them down into the vagina and afterwards to disengage the arms, in which I was successful; after which I drew the body down as far as the hips, which I was unable to do until I had again called upon the midwife for help, in order to terminate a labor which I had expected to end, according to all appearances, with every possible facility and which I found myself several times almost obliged to abandon.

"It was really astonishing for me to see this woman, who could not have been less worn out than I was, by vomiting which had accompanied her pains during the duration of this laborious delivery, immediately seize a piece of bread that she dipped in honey and thereupon ate with the best possible appetite. She had some difficulty in urinating, which was relieved by emollient fomentations which I had applied to the hypogastrium. Four days later she was quite well. The child was of monstrous size and the placenta in proportion to the size of the child, which was a boy.

"It is not alone in the size of the head and shoulders that resides all the difficulty of labor, when the child is of extraordinary size; this same difficulty is also to be found in the body, and is none the less embarrassing when the hips become engaged in the passage and only ends with its complete exit. It is, in truth, rare to find instances such as those I speak of in this chapter, but what is to follow will show that it is not impossible to meet with them, and this kind of labor all the more surprises the obstetrician because when he hopes to have ended his work he finds new difficulties which are opposed to it and which are terminated only with great labor and terrible efforts.

"When a child, such as I refer to, comes into the world alive and the mother gets along well, it is a very particular case, and this labor justly merits the name of an unnatural one, because it is quite as surprising as it is difficult to understand how Nature may rid itself of the trouble, with all the resources of the most talented obstetrician; but, no matter what labor he may be put to, when he is seconded by this sage workwoman, and when she does not deviate from her ordinary course, all this is nothing to compare with the difficulties to which he finds himself exposed when she leaves her accustomed path to take one in an opposite direction.

resisting equally all the efforts that a woman makes during labor in order to be delivered, a thing which she cannot do unless some foreign help is brought to play, which can only be found in the use of instruments; both are equally justifiable in the cases which are now to be related.

"The 12th of November of the year 1711, I was requested to deliver a laborer's wife about half a league away from this town. Her condition, when I arrived, appeared to me of the most pressing nature; by vaginal examination I found the head of her child well down in the passage; the pains, which were extremely strong and came nearer together, led me to hope that this labor would end very shortly; it, however, lasted more than four long hours before the head made its exit; the shoulders also resisted and I could only make them come down after I had introduced my fingers into the axillæ, after which I disengaged the arms and thought the thing ended, but the size of the body did not give way to my efforts. I had quite as much trouble with it as with the shoulders, and the hips also gave me a great deal, and were extracted only after having added the help of the nurse to my efforts, which we both employed to our best ability in order to terminate the affair. It was a boy who was delivered quite alive and well. I then delivered the mother of a very large placenta.

"*Reflections.*—Although twice I have found that recourse to midwives was fatal to me, necessity obliged me to try it this third time, but without having any apprehension, because at the point where this midwife took her hold in order to help me to accomplish the extraction of this child, it was of no consequence in drawing the child by the middle of the body, because if it had been by the head she might have pulled it from the body, which would have remained within the womb; as, on the contrary, if it had been the body which had come out, the head, from too great pulling, might have remained within the womb, as well as a single leg."

Here is another case of the same description: "I also delivered two women during this same year, 1712, of two children; the latter was so large that it was almost impossible for me to deliver the hips.

"In the cases of M. M—— are to be found many labors rendered difficult by the extraordinary size of the head and shoulders, but none are to be found where the body or hips have formed some obstacle to the exit of the child. I, however, mention not only those which appear to be authentic through relationship to the

circumstances, but still more through the assured testimony of the children who have been the subjects and who have been the cause of great astonishment on the part of numerous persons who have seen them.

"When the child presents by the back of the neck and the shoulders, the neck bent forwards, and the face on the chest, or very near to it, he will certainly perish if not promptly helped, because this is such a constrained position that the circulation is absolutely intercepted in the vessels of the neck, as well as the spirits which cannot flow in the nerves and be distributed to the parts to give to them their ordinary movements on account of the violent extension from which the spinal cord suffers, and, as life is only kept up by means of these two liquors, it will of necessity end as soon as the child is deprived of the circulation. Delivery alone can prevent this unfortunate outcome, and still more is it necessary that this should be executed before the pains have engaged the child in the passage, because the more it comes down, the more the obstruction, and consequently the danger, increases, as it is easy to observe in the following case.

"It is very difficult to assure oneself, when a woman is in labor, that the waters have flowed away, and when the child presents a head far advanced in the passage, whether he has the face above or below, unless the child is little advanced at the commencement of labor immediately after rupture of the membranes and the flowing away of the waters, in the interval of a pain; this does not allow the hand of the surgeon liberty to enter the womb. One may obtain information by this means, but the child being advanced, as I say, and the introduction of the hand being absolutely prevented, it is almost impossible to recognize it, because the face being above or below, hardly changes at all the shape of that part of the head which presents, a thing which often leads the obstetrician into error and which he recognizes only at a time when there is no possibility of remedying matters, the pains being strong and frequent, the woman being, however, none the less well delivered, although the labor may be longer and more difficult.

"A woman that I had delivered several times, and whose labors had always been rapid and fortunate, sent for me on December 13 of the year 1689. I found her with slow pains, which increased a quarter of an hour after I had arrived, and had commenced more than two long hours before the membranes ruptured. I found the head quite low down, but it advanced with such slowness and with such infinite difficulty that the child which ordinarily fol-

lowed the waters in all her preceding labors, came in this one only two entire hours after the waters had flowed away, and also with more violent and frequent pains than a woman of great courage, strong and vigorous, can endure. I was surprised to see that the cause of this difficult labor was due to the fact that the child presented with the face upwards, without my having noticed it during labor, although I gave all possible attention to it.

"I delivered this woman eighteen months later of a child who presented like the first ones, that is to say, with the face downwards and whose delivery was equally fortunate. I delivered the same woman on September 12, 1703, in another long and difficult labor, because the child again came with the face upwards, which was quite like that which had already taken place, and here, again, I did not recognize it until I found that I could only allow Nature to take her course.

"*Reflections.*—I cannot relate a more exact observation than this one to show one of the most essential causes of a long labor, difficult and unnatural, which happened twice to this lady, because every time that I delivered her and the children came as they should, that is to say, face downwards, they were most fortunate labors. And this case proves still more what I believe, that this difference in labors is to be found several times in the same patient, because several other women who had been delivered only once of a child born in this bad position would prove much less because they might have had long and difficult labors, although the child did come with the face below, whence, consequently, one might infer that this situation had not been the cause; a thing which cannot be said after an instance as evident as that of this lady.

"After all reflection, I have not found that more children died when they came in this position, although extraordinary, than those who came with the face downwards, but only that the labors were longer and more difficult, because the children can give more energy to their struggles and efforts in their ordinary position than in this one, as may happen to two men who swim equally well and who wish to go over the same course. It is impossible for them to go forward on the back to the same extent as when they swin on the belly, no matter what effort they may use, although they continue to go forward; the true position of a swimmer being on the abdomen, like that of a child who is coming in a labor with the face downwards.

"Nothing is easier than to say, as authors do, that when a child

comes with the face downwards, it is necessary to search for the feet and end the labor; but nothing is more difficult than to detect this position; I speak only after having been very frequently in error, after an experience of nearly thirty years, during which this presentation has offered itself to me many times. I speak of it only in order to point out this difficulty and to put it in evidence; because there is no means which has been described to me, through which, by touching the surface of a child enclosed within the membranes with its waters, can be demonstrated whether the face is upwards or downwards. Does not this surface appear alike in these two different positions and, in order to make a just discrimination, would it not be absolutely necessary to introduce the hand within the womb in order to be assured of this position through the membranes and the waters, and would it not still be necessary to rupture them, and is this a thing to propose?

"For that matter, when the membranes are ruptured, the waters flow away, and the head occupies the passage; is there an obstetrician, no matter how much experience he has had, who can judge that the child presents with the face upwards or downwards? That part of the head which then presents and which is the only thing which can allow him to recognize this position, is it not the same in both when examined per vaginam? And lastly, when this head is sufficiently advanced so that the obstetrician may be convinced, are the circumstances such as to allow him to turn the child? No, it is a necessity which he is obliged to meet when the child is in this position, but nevertheless, even if I were assured that the child presented in this way, the pains being strong and the waters well prepared, I would never undertake to turn in order to end labor; as only one child was lost out of all those that presented in this position, instead of the same misfortune which happened to a greater number which presented with the face downwards, as I shall show when I treat abnormal labors."

The next case is one where the child presented with the face forward. "When the pregnant woman has come to term, when she is sick in order to have a rapid and violent labor for delivery, at the first pain it happens, through an impetuous movement of the child, that the membranes break and the waters come away, but, although the child may be in the requisite position, that is to say, presenting the part of the head which should precede in order to come naturally, it changes position; instead of coming down the passage directly, as it was disposed to do according to the

natural order of things, by a strange occurrence it pushes the forehead against the os pubis of the mother and there becomes arrested without being able to become flexed, so that the child presents its face in full and its chin to the passage. The women who fall into this misfortune are all violently and continually in pain, a thing that I have never seen happen in long labors in which, although unfortunate, I have never seen a single woman die.

"A lady in the vicinity of Rouen came into this country where certain particular business called her. Being pregnant at term and feeling ill, she sent for me to see her on the 23d of March of the year 1697. I found her with pressing and rapid pains, the child presenting by the head, but far up, and the waters prepared and ready to burst, which occurred with the first following pain, during the time that I prepared the little bed; as the pain did not discontinue, I immediately had her lie down, with the hope that I would only have to receive the child. I was surprised that, instead of finding the head which I had found a minute previously, and of which I had fully assured myself both by the even roundness as well as by its hardness and solidity, it was the face which entirely filled the passage and that it was very low down. I wished to try to lower it a little by pushing the chin downwards; I could not succeed in this, but the strong pains which increased without cease, upheld by the strength of the patient, were of such great aid, added to that which I could give her, that she was delivered happily an hour and a half, or about that time, after I had arrived. I delivered her and allowed her to rest without doing anything further; I mean to say that it was necessary to put her to bed. She was so weak from the violence of the labor, although it had not lasted long, that she could not even speak. The good care, the good food, and the desire to soon be up in order to attend to her business, made her neglect nothing to attain this end. The child was horrible, not only on account of the leaden color of its face, but also by the puffiness which greatly worried the lady. I relieved her of her uneasiness by assuring her that before the end of the day her child would be fine and white, as did happen in less than twelve hours.

"*Reflection.*—This woman was fortunate to be delivered in so short a time, considering the bad position of her child, which appeared to me one of the most unfortunate in which a child can present, particularly so when it is so advanced that it cannot be turned; that the pains of the mother were of a violence without

cease and induced me only to aid them so far as Nature could not employ them in another way with the fear I had that she might rupture the chest or the abdomen, or at least that she should burst some blood vessel, which would make her die; it was these very violent and frequent pains which prevented me from searching for the feet by the impossibility which such a condition causes; which, on the contrary, gave hope to my mind that a happy outcome would ensue, seeing that Nature forgot nothing to bring the labor to a happy end. In fact, how would I have been able to find sufficient room for my hand, since it was not possible to even lower the chin, so as to place the head in its natural situation, which was the only thing that was wanting in this labor to make it fortunate.

"Children who are born into the world in this way are usually very livid, because the obstruction that the vessels suffer by the violent extension of the neck causes them to become extraordinarily full and produces this condition; as happens to a man whom one wishes to bleed from the jugular, or who squeezes his neck too much; but this accident disappears as soon as the vessels have regained their natural situation, and the blood its ordinary course.

"The wife of a draper of this town, pregnant for the first time, had arrived at term, and sent for me to see her on June 13 of the year 1699. I found her with very hard pains. The waters had come away and the child presented full face in the passage; as it was only slightly advanced, I tried to turn, but the passage was so filled and the womb so contracted on the child that I would probably have ruptured everything in order to gain my end. As I could not succeed by this means, I gave all my attention to pushing the chin downward a little with one hand, while with the other I tried to lower the upper part of the head, so as to make it present to the passage in the way that it should in order to come naturally; my intentions were good, but they were without effect, which reduced me to the necessity of leaving the labor to Nature, which required half a day, so that the mother and the child would both have perished if they had not had so much strength and courage. It was a large boy which came, quite as hideous as the first, and it righted its appearance in the same way. I delivered the mother, who was absolutely fatigued, but who did well afterwards and her child likewise. I have delivered her since and always of children badly placed and extremely large."

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THE RELATION OF CONCEPTION AND BIRTH TO SEASON AND HOUR.*

BY
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It frequently falls to the lot of every obstetrician to spend many weary hours of the night patiently awaiting the advent of an heir. His life has truly become, as Dr. King says, "A melancholy attendancy upon misery, a mean submission to peevishness, and a constant interruption to pleasure."

There is a popular idea among the laity, and physicians as well, that the great proportion of labor cases terminate at night, frequently after midnight; some explain it not as a mere coincidence, but as nature's effort to protect the eyes of the infant from the glaring rays of the sun. For a well established fact, theorists readily propose a "raison d'être." With a view to refuting or more substantially fixing this long cherished conviction, I have analyzed, without bias, 4,000 consecutive confinements in which these data were available. The cases occurred at Columbia Hospital, Washington, between 1880 and 1901, and I am omitting the cases in which there was reasonable doubt about the hour, such as the absence of "A. M." or "P. M." The hour specified refers to the time of the completion of the second stage. Instrumental cases are included, but abortions are excluded, as the latter are, to a surprising extent, criminal in nature, hence without bearing on natural laws.

A classification into white and colored was made in order to estimate the influence of race. We shall first consider the day as divided into two periods of twelve hours each, from 8 A. M. to 8 P. M and 8 P. M. to 8 A. M.

TABLE I.

	White		Colored.		Total.	
Periods.	No.	Per cent.	No.	Per cent.	No.	Per cent.
8 A. M. to 8 P. M...	780	50.3	1,199	49	1,979	49.4
8 P. M. to 8 A. M..	770	49.7	1,251	51	2,021	50.5
Total	1,550	100	2,450	100	4,000	100

*Read before the Washington Obstetrical and Gynecological Society, April 7, 1905.

According to the above table, in 1,550 white cases 0.3 per cent. more than one-half the cases occurred during the day, while in the other group of 2,450 cases 1 per cent. more than one-half occurred during the night. Just why there should be a larger number of colored cases terminating at night cannot be ascribed to hereditary influences. The opposite results obtained in the two races, while trivial, lose their significance if we stop to consider that the races have been blended by intermarriages and immorality. The total percentage is, perhaps, a better guide, and we find that a scant 1 per cent. more cases occur at night than during the day. I believe this fraction may be disregarded and no importance attached to it.

Should we divide the day and night into periods of eight hours each, namely, 6 A. M. to 2 P. M., 2 P. M. to 10 P. M., and 10 P. M. to 6 A. M., using the same cases, Table II. will show that the greatest variation is between the 2 to 10 segment and the 10 to 6 in the colored. The third period (6 A. M. to 2 P. M) is only 0.6 per cent. below one-third of the cases.

TABLE II.

	White.		Colored.		Total.	
Periods.	No.	Per cent.	No.	Per cent.	No.	Per cent.
6 A. M. to 2 P. M..	498	32.1	810	33.	1,308	32.7
2 P. M. to 10 P. M.	524	33.8	777	31.7	1,301	32.5
10 P. M. to 6 A. M.	528	34.1	863	35.2	1,391	34.7
Total	1,550	100	2,450	100	4,000	99.9

Taken collectively, a slight preponderance of the cases occur between 10 P. M. and 6 A. M., 1.4 per cent. more than one-third, hardly enough to lay stress upon. Probably another series of several thousand cases would have the largest percentage during one of the other periods. At any rate, the statement that the majority of births occur at night should be given no prominence, or else be qualified. A proportion as small as I have shown may be accidental. Why such a popular fallacy exists is only problematical and may be accounted for in a number of ways. Cases occurring at night necessitate, for the physician, hours of work usually spent in sleep or recreation; it means a derangement of a routine, a broken compensation, and such an event certainly impresses itself more forcibly than those occurring in the bustle of a busy day. They stand boldly out from other cases, as we associate them with the disagreeable sensations. We know that only our vivid dreams, among our countless thousands, are sufficiently impressive to be

retained in our memory until even the following day, and so we may presume that it is only the night cases, with their tediousness and uncertainty that blaze their way through the forest of cerebral cells to find a resting place whence they may be summoned.

It is also a common belief among the professional inmates of a lying-in hospital that one labor case heralds the approach of others, that there is a mysterious influence communicated from the first to others in waiting; and there seems to be some ground for it. I have frequently witnessed a "wave" of uterine pains sweep over a maternity ward, and several cases go into active labor at once, followed by a lull, and another uterine storm. It is an interesting condition, the causative agent of which is probably suggestion, but that is a field for others than the obstetrician.

For generations it has been supposed that births, and necessarily conceptions, occur in relatively greater numbers during certain months or seasons. This may be the result of old statistics applied to modern conditions without investigation. It has been stated, and apparently substantiated, that the greatest number of conceptions occur in April and May, and while this may apply to other vertebrates than man, the law seems shaken by looking into the facts. My study, while not comprising sufficient cases to satisfy the skeptical, seems to cover a reasonable number upon which to venture an opinion.

The spring months associate themselves in our mind with growth and multiplication of species in plant life, the mating of birds, and even the poet sings of it: "When a young man's fancy lightly turns to thoughts of love." The rutting of animals is typical. The Esquimaux, we are told, after their six months' night, devote the first three or four weeks of the long day to a courtship which usually terminates in marriage. It was the custom of Rome, Greece, India, North and South America to set aside days or weeks to a festival devoted principally to worship at the shrines of Bacchus and Venus. In ancient Peru, the orgy was a five days' feast, terminated by a blast from a trumpet, a signal for the men and women, assembled entirely nude, in a public square, to race for a rendezvous. Those maidens who were overtaken by the youths in the chase, freely surrendered themselves to the passion of their captors. Analogous customs existed among the Russians, Bohemians, and Bengal tribes, but these practices have not survived.

Baron de Montesquieu,[1] writing some centuries ago, did not question the influence of season, and, more particularly, of climate, upon morality: "From this delicacy of organs peculiar to warm

climates it follows that the soul is most sensibly moved by whatever relates to the union of the two sexes. In northern climates scarcely has the animal part of love a power of making itself felt. . . . If we travel toward the north, we meet with people who have few vices, many virtues, and a great share of frankness. If we draw near the south, we fancy ourselves entirely removed from the verge of morality; here the strongest passions are productive of all manner of crimes, each man endeavoring, let the means be what they will, to indulge his inordinate desires."

Attention to periodicity of birth-rate was first noted in 1767 by Wargentin, but the subject received scant notice until Quetelet verified his statements, showing maximum of births in February with maximum of conceptions in May. Wappans confirmed these statements from the birth-rate of Europe, though he found them modified by harvest work, epidemic diseases, and church laws. Other observers have come to the same conclusion. The winter months of Russia are the most prolific, ascribed to the stringent secular traditions and severely observed feasts.

Haycroft, from data of Scotland, concluded that the conception curve paralleled the temperature curve, and for every average monthly rise of 1 degree F., the birth-rate increased 5 per cent. Mayr states that the greatest number of conceptions in Europe occur in May; the fewest in September.

Ellis[2] finds a maximum in April, May, and June, which bears a definite relation to the fastigium of the curve of seminal emissions during sleep as determined by Nelson. The demand for books at public libraries has been used as an index of sexual impulses and the trend of such thought would appear to be more prevalent in the spring.

Ellis further says, "thus, while the sexual climaxes of spring and autumn are rooted in animal procreative cycles, which in man have found expression in primitive festivals, these again perhaps strengthening and developing the sexual rhythm, they yet have a wider significance. They constitute one among many manifestations of spring and autumn. They resemble those periods of atmospheric tension of storm, and which accompany the earth's rhythm, and they may fairly be regarded as ultimately a physiological reaction to those cosmic influences."

Feffingwell's[3] table of births in England and Wales for each quarter of the year during four decades conclusively points out that the birth-rate per thousand living persons is greater in the first

two quarters, therefore, the conceptions must have occurred at other periods, a wide variance from Mayr's statistics.

Leffingwell says: "Legitimate births, therefore, appear to be slightly under the influence of seasons. The difference in reproductive proclivity is not great, but is fairly suggestive of permanent influences. More striking is the evidence of periodicity of those relationships which occasion illegitimate births. If in the earlier stages of human development out of animalism there did exist the stronger instincts of the brute, we might expect to find the trace to-day whenever passion is more powerful than the respect due to custom, relation, and law."

Englemann[4] has dissipated the erroneous views formerly entertained that menses first appeared in warm climates and were retarded as the Arctic regions were approached. As a matter of fact, climate exerts no influence.

In the same series of cases from which I have taken the data concerning the hour of birth, effort was made to associate the maximum conceptions with season or month. They were classified into white and colored, legitimate and illegitimate. There was absolutely no appreciable relation to season. Dr. W. F. R. Phillips, of the Weather Bureau, kindly furnished the average monthly temperature and humidity from 1880 to 1901 inclusive, and by a strange coincidence, the government observations were made within a hundred yards of the delivery ward of the hospital. A constant ratio could not be established on this basis. February seemed as fertile as May, and an exceptionally warm month was not expressed in family additions subsequently.

This seems to be and is a contradiction to the generally accepted beliefs. Unquestionably our social environments, duties, and habits are responsible in a great measure for the deviation. At this day we can in no way be compared with primitive types; mechanical inventions have almost obliterated the discomforts of climatic changes; ecclesiastical laws have prohibited marriages during specified periods; we have become creatures of habit, and fashion has almost decreed the months when marriages shall be consummated. The rearing of a family often interferes with the pleasure of life, and "race suicide" has become a popular phrase.

The increasing knowledge among the public of the methods of inducing abortion has been the chief factor in diverting normal pregnancies. A popular textbook[5] states that one pregnancy in every five terminates in miscarriage; whereas in former editions of this work the ratio was placed at one in twelve. This emphasis,

however, is hardly necessary; the condition is only too well known to the obstetrician and gynecologist. In child-bearing women, parturition is regulated with almost mathematical precision.

The foregoing statements may not be accepted without further proof. We are loath to replace fond fancies with uninteresting facts, and it is possibly far better that we be conservative and lean toward safe and sound figures which cannot be assailed, in order to avoid statistical hysteria.

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LEUCOCYTOSIS IN GYNECOLOGY.

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Most gynecological diseases lack the marked acuteness of many of the surgical emergencies that come under the care of the general surgeon. Inflammations of the pelvic organs usually run a slow course compared with the rapidity of a perforative appendicitis, a ruptured tubal pregnancy frequently goes for some days before operative interference without great harm to the patient, an ovarian cyst with a twisted pedicle completely obstructing the blood supply may remain quiescent for some days without the urgent symptoms of a strangulated hernia. Naturally in the slow cases the resisting forces of the organism are brought into action less energetically and the marked changes of the more rapid diseases in the blood are not found. If, however, the changes which do occur are carefully studied in conjunction with the other symptoms, valuable assistance will often be obtained. In this paper, special attention will be given to the white blood cells though in many cases the number of red blood cells and the percentage of hemoglobin are recorded. In all cases tabulated, the diagnosis was confirmed by operation by

the writer. The period of time covered by the series was the past three years. All operative cases of this period are not included, as in many cases no blood examination was made, but the cases that are tabulated are not selected cases and are representative of their types.

The blood counts were made usually between 9 o'clock and 12 o'clock in the morning by members of the hospital house staff, men who are not expert pathologists but have been carefully trained, have done a large amount of work and undoubtedly are accurate in their findings. That the counts were made in the routine work of the hospital and not for material for this paper, will account for the irregularity in the number and time of the examinations in different cases. The temperature and pulse recorded represent the highest of the day.

TABLE I.

ECTOPIC PREGNANCY.

Case No.	Date	Temp.	Pulse	Leucocytes	Red B. C.	H B.	Diag. and Oper.
1	Sept. 9	100	80	11,000			L. unruptured. Dermoid Cyst R. ovary.
	Sept. 11		...				Resection L. tube. Removal R. ovary.
2	Mch. 19	98.8	80	7,000	4,300,000	75%	L. unruptured.
	Mch. 25		...				Resection L. tube.
3	Nov. 27	98.8	72	10,400	5,000,000		L. unruptnred.
	Nov. 29		...				L. salpingo-oophorectomy.
4	Nov. 4	101.2	152	25,600			L. recent rupture.
	Nov. 4		..				L. salpingo-oophorectomy.
5	July 15	99.8	88	7,750	3,500,000	75%	L. recent rupture.
	July 17		...				L. salpingo-oophorectomy.
	July 19	103	140	16,500	0,704,000	30%	
	July 22		...				Died, pneumonia.
6	July 19	100.4	100	12,000		40%	R. recent rupture.
	July 20		...				R. salpingo-oophorectomy.
	July 21	101.6	128	9,000	2,400,000		
7	Sept. 20	99.4	124	11,000		32%	Pelvic hematocele.
	Sept. 20		...				Vaginal incision.
	Sept. 28	100	120	7,000	3,160,000	35%	
	Oct. 10	98.8	92	5,000	4,256,000	50%	

8	Jan.	2	102	120	9,700		90%	Pelvic hematocele.
	Jan.	19						Vaginal incision.
9	June	28	99.6	88	5,000	4,000,000	70%	Pelvic hematocele.
	July	2						Vaginal incision.
10	Feb.	6	99.2	78	6,000	5,168,000	70%	Pelvic hematocele.
	Feb.	7						Vaginal incision.
	Feb.	10	100.4	84	6,000		65%	
11	Feb.	24	100.2	84	6,000	4,000,000	70%	R. Tubal abortion.
	Feb.	25						R. salpingectomy.
	Feb.	26	100	96	8,500			
12	Jan.	17	99.4	96	7,500	4,100,000	75%	Pelvic hematocele.
	Jan.	18						Vaginal incision.
	Jan.	19	102.2	132	14,000			
13	June	6	99.8	86	7,500			R. tubal abortion.
	June	10						Resection R. tube.
14	Sept.	5	99.6	88	10,400		70%	L. tubal abortion.
	Sept.	8	98 2	80	19,000		65%	
	Sept.	11	99	76	14,500			
	Sept.	17	99	68	8,000	4,000,000	65%	
	Sept.	18						L Salpingo-oophorectomy.
15	July	27	99	76	9,500	4,500,000	65%	L. tubal abortion.
	July	28						L. salpingo-oophorectomy.
16	Mch.	24	103	128	21,000			Pelvic hematocele.
	Mch.	4						Vaginal incision.
	Mch.	31	103	124	15,000			
17	Aug.	6	100.8	104	10,000	2,544,000	43%	Old abdominal pelvic hematocele.
	Aug.	9	100.6	104	9,800		53%	Complete abdominal hysterectomy
18	July	10	100.4	104	18,700	3,112,000	62%	R. tubal abortion; L. pyosalpinx.
	July	12	100 8	120	15,000			
	July	12						L. salpingo-oophorectomy.
	July	14	104.4	130	16,000			
	Aug.	4	98.8	100	6,700	3,900,000	52%	
19	Feb.	16	100	100	13,000	2,900,000		L. tubal abortion.
	Feb.	18	101	100	11,000			
	Feb.	18						L. salpingo-oophorectomy.
20	Aug.	29	100.2	...	22,400	3,232,000	30%	Sixth-month fetus in abdominal cavity.
	Aug	29						R. salpingo-oophorectomy.

The cases of ectopic pregnancy for consideration can conveniently be divided into four classes.

a. Unruptured.
b. Recently ruptured and bleeding.
c. Hematocele without infection.
d. Hematocele with infection.

Cases 1, 2, and3 were unruptured, and no one of the three was diagnosed as ectopic pregnancy previous to the operation. Case 1 was operated on for ovarian cyst and cases 2 and 3 were thought to be inflammatory though the possibility of ectopic pregnancy was considered. There is no reason to expect an increase in the white cells in cases of unruptured ectopic pregnancy without complications, and the slight increase in cases 1 and 3 is not significant. Cases 4, 5, and 6 were cases which had recently ruptured, and of these case 4, with a count of 25,600, made a few hours after rupture, is of special interest. At the time of operation the patient was in an extreme condition, pulse of 152, abdomen distended and found when opened to be filled with blood, that is, a case with a recent large hemorrhage. This is in accord with observations of patients who have lost a large quantity of blood at surgical operations. Following a surgical operation with severe hemorrhage Lyon quoted by Ewing, found after one hour 41,625, after five days 14,300 leucocytes. And also with an observation of Pankow who records one case of recently ruptured tubal pregnancy with a white blood count of 31,480. Case 5 had no leucocytosis at the first examination two days before operation. While under observation in the hospital, the tube ruptured and two days later there was a leucocytosis of 16,500. This increase was due probably in part to the post-operative leucocytosis and in part to blood lost between the time of rupture and that of the operation. The decrease in the number of red cells and in the hemoglobin is too great to be ascribed to the operation only.

In cases 7 to 15 inclusive the rupture had occurred some days previous to the examination with the formation of a hematocele which was shut off from the general peritoneal cavity by adhesions. In none of these cases at the operation were there signs of a recent rupture nor of any active inflammation. With the exception of Case 7, in which the hematocele extended nearly to the umbilicus, and in which the leucocytes amounted to 11,000 and the hemoglobin to only 32 per cent. none of these cases had had any great hemorrhage as shown by little or no change in pulse, red cells and hemoglobin and none of them showed any special leucocytosis at the initial examination. Case 14 with an

increase in leucocytes from 10,400 to 19,000 and a decrease in hemoglobin from 70 per cent. to 65 per cent. in an interval of three days without a change in pulse or temperature, suggests that the case was bleeding at the time. Cases 16 to 20, inclusive, comprise those cases which at operation gave evidence of recent inflammation. Case 17 was an extensive case with broken down blood clot filling pelvis and lower part of abdomen, and was considered at first to be an exudate due to an abortion. Case 18 was a right tubal abortion associated with a left pyosalpinx. The leucocytosis of 18,700 was undoubtedly due in part to the pyosalpinx. Case 20 was an obscure case that had refused operative intervention until her general condition was bad. At the operation, a sixth month fetus was removed from the abdominal cavity. This patient died. The leucocytosis of 22,400 was due probably to the inflammatory condition about the fetal sac.

Conclusions.—A tubal pregnancy in which the tube is unruptured and is not aborting causes little or no leucocytosis. With a tubal rupture or abortion there is an initial high leucocytosis depending on the amount and rapidity of the hemorrhage, and this leucocytosis diminishes as the bleeding ceases. After the blood has been encapsulated there is but slight leucocytosis unless it becomes infected or is complicated by other inflammatory conditions

TABLE II.

Pelvic Abscess.

Case No.	Date	Temp.	Pulse	Leucocytes	Red B. C.	H.B.	Diag. and Oper.
1	Nov. 9	99.8	76	7,200		80%	Pelvic abscess.
	Nov. 14	99.6	80	8,000		70%	
	Nov. 22	98.6	68	6,000		75%	
	Nov. 22						Vaginal incision.
2	Aug. 17	99.8	88	8,000		60%	Pelvic abscess.
	Aug. 21						Vaginal incision.
	Aug. 22	100.6	112	19,400		70%	
	Aug. 25	99.6	90	13,000		60%	
	Sept. 1	98.8	80	12,000		60%	
3	July 15	99.6	72	10,000			Pelvic abscess.
	July 17						Vaginal incision.
4	July 25	102.6	116	10,000		65%	Pelvic abscess.
	July 27	103.8	104	8,000		65%	
	July 28						Vaginal incision.

5	Oct. 25	99.6	72	12,000		65%	Pelvic abscess.
	Oct. 25		..				Vaginal incision.
	Nov. 7	98.6	78	6,000		65%	
6	June 23	99.4	92	12,750		55%	Pelvic abscess.
	July 18		...				Vaginal incision.
7	Oct 1	100.2	104	15,000		65%	Pelvic abscess.
	Oct. 11	99.6	90	12,000			
	Oct. 16		...				Vaginal incision.
8	Aug. 8	101.6	120	15,600			Pelvic abscess.
	Aug. 19		...				Vaginal incision.
9	Sept. 23	102	128	16,000		55%	Pelvic abscess.
	Sept. 29		...				Vaginal incision.
	Oct. 3	102	128	22,000			
	Oct. 6	103.2	128	21,500			
	Oct. 10	100.4	104	13,000			
10	Aug. 10	101.6	120	16,700		72%	Pelvic abscess.
	Aug. 19	102	108	18,000		60%	
	Aug. 21	101.6	108	18,000			
	Aug. 22		...				Vaginal incision.
	Aug. 25	101.4	116	12,400	4,836,000	70%	
11	Dec. 13	99.8	100	17,700	1,476,000		Pelvic abscess.
	Dec. 21	101.2	112	11,700	2,536,000	50%	
	Jan. 2	101.8	108	15,600			
	Jan. 4		...				Vaginal incision.
12	July 5	103	112	18,700			Pelvic abscess.
	July 7		...				Vaginal incision.
13	Sept. 14	103.6	112	19,000		60%	Pelvic abscess.
	Sept. 17	102.4	112	15,000		52%	
	Sept. 18		...				Vaginal incision.
	Sept. 19	99.6	112	18,000		63%	
	Sept. 22	100	100	17,000		65%	
	Sept. 25	102.4	120	14,400		75%	
14	Oct. 3	102.2	104	24,120	3,476,000	75%	Pelvic abscess.
	Oct. 8	101.4	96	22,630			
	Oct. 12	103	104	21,900			
	Oct. 15		...				Vaginal incision.
	Oct. 19	101.8	104	22,600			
	Oct. 23	100 4	96	15,700			
	Oct. 27	100.4	96	16,600			
	Oct. 30	100	102	16,600			
15	Nov. 15	102	116	27,400	4,800,000	90%	Pelvic abscess.
	Nov. 16		...				Vaginal drainage.
	Nov. 18	100.4	112	30,000	3,900,000		
	Nov. 29	99	88	11,500			
	Dec. 10	104.4	1 4	17,200			
	Dec. 14	101	104	6,500			
16	Aug. 20	102.6	120	22,000		75%	Pelvic abscess.
	Aug. 22		...				Vaginal incision.
	Sept. 14	98.6	88	11,000			
17	Sept. 15	102.4	112	22,000		60%	Pelvic abscess.

	Sept. 16		...				Vaginal incision.
	Sept. 19	102	120	18,000		60%	
	Sept. 22	102	120	13,000			
	Sept. 30	101.8	124	10,000			
	Sept. 17	102.8	136	18,000			Pelvic abscess.
	Sept. 19		...				Second vaginal incision.
18	May 7	100	120	34,750		50%	Pelvic abscess, vaginal incision.
	May 13	101.4	108	29,500		30%	
	May 18	102.2	116	23,750			
	May 25	104.8	128	24,000		35%	
	June 9	102.6	112	9,000		40%	
19	Mch. 29	100.2	104	38,000		70%	Pelvic abscess.
	Apr. 2	101	116	6,500		65%	
	Apr. 4		...				Vaginal incision.

The term "pelvic abscess" as used in Table II is used to include any abscess in the pelvis, the exact anatomical location of which could not be determined. The operation in all the cases here tabulated was an incision posterior to the cervix into the abscess cavity and drainage with gauze or rubber tube.

Cases 1, 3 and 4 were probably cases of pyosalpinx in which the acute symptoms had largely subsided and were treated by drainage without removal because the abscess was in close proximity to the vaginal vault and the patient's age made it undesirable to remove the appendage. These cases show practically no leucocytosis. Cases 5 to 19 represent acute inflammatory conditions in which the appendages were bound down by recent exudate. These cases if operated upon through the abdomen constitute the most difficult and dangerous gynecological operations and a vaginal incision with drainage has been in the hands of the writer a valuable and safe procedure as a preparation for a subsequent abdominal operation and in many cases as a curative remedy. In ten of these fifteen cases the leucocytosis was between 15,000 and 25,000, in two below 15,000 and in two over 30,000. These cases undoubtedly represent the early acute stage of the more severe types of inflammatory disease of the appendages. In the majority of these cases left without operation, the exudate would ultimately be absorbed, leaving a chronic abscess in one or both tubes and ovaries. The differential diagnosis between a pelvic abscess and a retrouterine hematocele is sometimes extremely difficult. It is in this class of cases that the greatest benefit is derived from a knowledge of the number of leucocytes present. The cases of hematocele without

infection recorded in Table I have only a small or no increase in the white cells, while the leucocytosis in the cases of pelvic abscess is marked.

TABLE III.

Inflammation of Appendages.

Case No.	Date	Temp.	Pulse	Leucocytes	Red B. C.	H. B.	Diag. and Oper.
1	Nov. 21	99.4	80	6,000		65%	Double pyosalpinx.
	Nov. 22		...				Supravaginal hysterectomy.
2	July 8	99.4	72	7,000			R. pyosalpinx.
	July 12		...				Supravaginal hysterectomy.
3	Aug. 10	98.8	64	7,200		70%	R. pyosalpinx.
	Aug. 12		...				R. salpingo-oophorectomy.
4	Nov. 8	101	104	8,000		60%	L. pyosalpinx.
	Nov. 12	100	108	13,000		70%	
	Nov. 22	100.2	96	12,700		65%	L. Salpingo-oophorectomy.
5	May 11	99.4	72	8,000		60%	L. tubo-ovarian abscess.
	May 16		...				L. salpingo-oophorectomy.
	May 31	104	112	7,000		60%	
6	Dec. 24	99 2	88	8,400		75%	Double pyosalpinx.
	Dec. 29	99.4	104	7,700	3,688,000	70%	
	Jan. 3		...				Supravaginal hysectomy.
7	Mar. 26	102	92	9,000		60%	Double pyosalpinx.
	Mar. 28		..				Complete hysterectomy.
8	Jan. 26	99.4	92	9,000			R. tubo-ovarian abscess.
	Jan. 28		...				R. salpingo-oophorectomy.
9	Aug. 31	99.8	92	9,400	3,968,000	43%	Double ovarian abscess.
	Sept. 2		...				Supravaginal hysterectomy.
10	Oct. 4	99.6	92	9,400		65%	Double pyosalpinx. Supravaginal hysterectomy.
	Oct. 10	99	96	9,200		65%	
11	Mar. 20	99	84	9,500	4,400,000	53%	Double pyosalpinx.

	Mar.	21		...				Complete hysterectomy.
12	Jan.	23	99.4	96	10,000		70%	Double pyosalpinx.
	Jan.	29		...				R. salpingo-oophorectomy.
13	Dec.	6	98.8	106	10,000		40%	R. Pyosalpinx R. salpingo-oophorectomy.
	Dec.	16	104.4	128	26,000		25%	
	Jan.	2	99	104	6,000		35%	
14	Mar.	1	100.4	104	10,500			Double pyosalpinx.
	Mar.	4		...				Complete hysterectomy.
15	July	7	101.8	100	11,000			R. pyosalpinx.
	July	11	100.4	100	13,500	4,312,000	75%	
	July	14	99.4	92	10,000			
	July	15		...				Supravaginal hysterectomy.
	July	28	100.2	104	5,000			
16	Oct.	18	102.8	102	11,000			Double pyosalpinx.
	Oct.	20	103.4	116	13,000			
	Oct.	21		...				Complete hysterectomy.
17	Jan.	9	98.8	92	11,500			Double pyosalpinx.
	Jan.	21		...				Supravaginal hysterectomy.
18	Jan.	26	99	84	11,500		60%	Double pyosalpinx.
	Jan.	27		...				Supravaginal hysterectomy.
19	Nov.	14	101.2	92	12,700	2,972,000	65%	Double pyosalpinx.
	Nov.	15		...				Complete hysterectomy.
20	Nov.	2	101.2	100	13,000			L. tubo-ovarian abscess.
	Nov.	6	101	88	14,800			L. Salpingo-oophorectomy.
21	Nov.	4	99.6	88	13,000		75%	Double pyosalpinx.
	Nov.	6		...				Complete hysterectomy.
22	Oct.	23	100	92	13,200		65%	Double pyosalpinx.
	Oct.	30		...				Complete hysterecomy.
23	Sept.	19	100.4	96	13,700		55%	R. pyosalpinx.
	Sept.	20		...				R. salpingo-oophorectomy.
24	Nov.	7	98.6	80	15,000		80%	Double pyosalpinx.
	Nov.	15	98 6	74	18,700		80%	Complete hysterectomy.
25	May	23	100	116	16,000		80%	Double pyosalpinx.

	June 6		...				Complete hysterectomy.
	June 21	99.4	96	8,000			
26	Oct. 8	100	110	16,000	5,000,000	95%	L. tubo-ovarian abscess.
	Oct. 8		...				L. salpingo-oophorectomy.
27	April 16	105	140	16,500		60%	L. ovarian abscess. R. pyosalpinx.
			...				Complete hysterectomy; died.
28	Sept. 19	102.4	112	16,600		60%	Double pyosalpinx
	Sept 24	102.8	108	11,000		55%	
	Sept. 29		..				Complete hysterectomy.
	Oct. 6	101.8	120	9,200		55%	
	Oct. 10	101.8	140	1,400		60%	Died.
29	Aug. 8	98.8	84	18,000		80%	
	Aug. 10	99.6	96	17,000		80%	L. pyosalpinx.
	Aug. 10		...				L. salpingo-oophorectomy.
30	July 10	100.4	104	18,700	3,112,000	62%	L. pyosalpinx.
	July 12	99.8	102	15,000			L. salpingo-oophorectomy.
	July 14	104.4	130	16,000		75%	
	Aug. 4	98.8	100	6,700	3,900,000	52%	
31	July 29	103	108	25,000		60%	L. ovarian abscess.
	July 30	100.2	92	15,000	3,544,000	62%	
	Aug. 1	100.2	92	18,000		60%	L. salpingo-oophorectomy.
32	Feb. 2	103.6	128	37,500			Purulent salpingitis; general peritonitis; complete hysterectomy; died.
33	Mar. 19	100.6	104	41,000			Double purulent salpingitis; complete hysterectomy.
	Mar. 20	103.2	152	44,000			
	Mar. 21	105 6	152				
	Mar. 22	102.4	136	27,000			
	Mar. 23	101 4	142	21,000			
	Mar. 24	100.8	040	25,000			
	Mar. 25	101.4	128	22,000			
	Mar. 26	101.4	128	18,000			
	Mar. 27	100	112	13,500			
	Mar. 28	101	108	11,000			
	Mar. 92	100.2	112	8,500			

Table III includes cases of inflammatory disease of one or both appendages, the type which necessitated the removal of the diseased organs. This table naturally follows Table II as these cases, with the exception of cases 31, 32 and 33, represent the subacute and chronic stages of the same class of cases that are recorded in Table II in the acute stage. Of the cases 1 to 30, thirteen had less than 10,000 leucocytes, eleven between 10,000 and 15,000, six between 15,000 and 20,000. Case 31, with a leucocytosis of 25,000, was an acute case with recent exudate about an old ovarian abscess, which I attempted to drain through the vagina, but as this was not successful, the abdomen was opened and the diseased appendage removed. The case was of the acute type of those in Table II. Cases 32 and 33 were cases of acute purulent salpingitis with spreading peritonitis, without adhesions, following recent abortions. These cases were of the most acute type, resembling cases of acute appendicitis. The leucocytosis was very high, 37,500 in case 32 and 41,000 in case 33 at the time of the operation. Case 32 died. Case 33 is recorded at some length as the case illustrates the value of the leucocyte count as an aid to prognosis. This case was in a serious condition, cosiderable tympanites, vomiting and a pulse varying between 140 and 150 for five days subsequent to the operation. By the third day the leucocytes had decreased to 27,000; that is in this case the improvement in the leucocytosis was forty-eight hours before the apparent improvement in the patient's general condition.

Conclusions from Tables II and III. During the acute stage of a severe inflammation of the appendages associated with more or less exudate and localized peritonitis there is a leucocytosis varying usually from 15,000 to 25,000, occasionally more than 25,000. As the acute symptoms subside the leucocytosis diminishes. In many chronic cases free from exacerbation there is practically no leucocytosis at all. If during the acute stage the peritonitis becomes general, the leucocytosis may be very high.

TABLE IV.

Fibromyomata Uteri.

Case No.	Date	Temp.	Pulse	Leucocytes	Red B. C.	H. B.	Diag. and Oper.
1	Dec. 6	99.4	48	6,000	1,400,000	15%	Fibromyomata uteri.

	Dec. 13	100.8	104	7,000	1,400,000	15%	Supravaginal hysterectomy.
	Dec. 20	101	100	12,700	1,584,000	25%	
2	Mch. 13	99	72	8,750	4,328,000		Fibromyomata uteri.
	Mch. 14		...				Supravaginal hysterectomy.
3	Nov. 18	99	74	10,800			Fibromyomata uteri.
	Nov. 19		..				Supravaginal hysterectomy (infected wound).
	Dec. 1	102.4	120	19,800			
	Dec. 7	100.2	100	10,000			
4	Nov. 25	99	100	5,600	3,330,000	55%	Fibromyomata uteri.
	Nov. 26		...				Complete hysterectomy.
5	Mch. 7	98.8	64	7,000	3,900,000	50%	Fibromyomata uteri.
	Mch. 7		...				Supravaginal hysectomy.
6	Mch. 29	98.8	80	9,000			Fibromyomata uteri.
	Apr. 8	98.8	90	15,000			Supravaginal hysterectomy.
7	Sept 7	99.4	88	7,000			Fibromyomata uteri; double pyosalpinx.
	Sept. 9		...				Supravaginal hysterectomy.
	Sept. 26	99.2	80	5,800			
8	May 27	101.8	100	7,750		45%	Fibromyomata uteri; double pyosalpinx.
	June 6		...				Supravaginal hysterectomy.
9	Nov. 14	99.2	84	9,000		65%	Double pyosalpinx.
	Nov. 20		...				Complete hysterectomy.
10	Mch. 12	99.8	84	11,500			Fibromyomata uteri; double pyosalpinx.
	Mch. 21		...				Complete hysterectomy.
11	July 9	102.2	118	14,750		90%	Fibromyomata uteri.
	July 15	98.8	80	8,000		90%	L. tubo-ovarian abscess.
	Aug. 7	98.8	96	9,000		75%	

	Aug. 7		..				Myomectomy.
	Aug. 04	101	120	16,000		70%	L. salpingo-oophorectomy.
	Aug. 20	100.4	112	15,500		80%	
12	Nov. 28	99	100	15,000		70%	Fibromyomata uteri; double pyosalpinx.
	Nov. 29		...				Complete hysterectomy.
13	Nov. 1	98.8	104	17,500		65%	Fibromyomata uteri; R. pyosalpinx.
	Nov. 1		...				Myomectomy, R. salpingo-oophorectomy.
	Nov. 3	100	104	24,000		65%	
	Nov. 14	101.4	106	11,200		70%	
14	Nov. 1	98 8	104	17,500		65%	Fibromyomata uteri, R. pyosalpinx. Myomectomy, R. salpingo-oophorectomy.
	Nov. 3	100	104	24,000		65%	
	Nov. 14	101.4	106	10,200		70%	

Table IV comprises those cases in which fibroid tumors of the uterus constituted the chief pathological lesion. Cases 1 to 5 were cases without degenerative changes and without disease in the appendages. There was no significant leucocytosis in any of these cases previous to operation. Case 3 showed marked leucocytosis on the thirteenth day due to wound infection. Case 6 had a fibroid about two inches in diameter which had recently become gangrenous from interference with the blood supply. The leucocytes increased with this change from 9,000 to 15,000 without material change in pulse or temperature. Cases 7 to 14 comprise those cases in which the fibroid tumor was complicated with tubal disease. The leucocytosis was doubtless due to the complication.

Conclusions from Table IV. Fibromyomata that have not degenerated show no leucocytosis unless complicated by disease of other organs. A degenerated fibroid may cause a leucocytosis.

TABLE V.

OVARIAN CYSTS.

Case No.	Date	Temp.	Pulse	Leucocytes	Red B. C.	H. B	Diag. and Oper.
1	Sept. 16	99	76	7,000		80%	L. ovarian cyst.

	Sept. 18		...				L. salpingo-oopho-rectomy.
2	Oct. 3	98.8	100	8,500	4,000,000	85%	Double ovarian cysts.
	Oct. 3		...				Supravaginal hys-terectomy
	Oct. 9	100.8	108	10,000			
3	Feb. 28	99.6	92	8,500			R. ovarian cyst.
	Feb. 28		...				R. salpingo-oopho-rectomy.
4	Jan. 17	98.6	92	9,400	3,688,000	65%	R. ovarian cyst.
	Jan. 17		...				R. salpingo-oopho-rectomy.
5	July 16	98.8	76	8,000		95%	Intraligamentous cyst.
	July 16		...				Drained
6	July 29	101.8	96	10,000		65%	L. ovarian cyst rup-tured.
	July 31		...				L. salpingo-oopho-rectomy.
7	Sept. 14	101.4	108	9,000			L. ovarian cyst, suppurating.
	Sept. 16		...				Drained.
	Sept. 26	103.6	108	16,000			
8	Oct. 27	102.4	98	10,200			L. ovarian cyst, suppurating
	Oct. 31	102.4	100	14,000			Fibromyomata uteri.
	Nov. 7		...				Complete hysterec-tomy.
9	Feb. 19	102.4	104	17,000			R. ovarian cyst, suppurating.
	Feb. 21		...				R. salpingo-oopho-rectomy.
10	Feb. 12	102.6	112	17,000			R. ovarian cyst, suppurating.
	Feb. 19	102.8	112	17,000			
	Feb. 21		...				R. salpingo-oopho-rectomy.
10	Feb. 10	102	120	26,000			L. ovarian cyst, suppurating.
	Feb. 18		...				Supravaginal hys-terectomy.
12	Feb. 26	100.2	116	18,800		75%	L ovarian cyst, twisted pedicle.
	Feb. 28		...				L. salpingo-oophorectomy.
13	Mch. 10	99	96	9,000			Malignant papil-loma of ovaries.
	Mch 11		...				Exploratory lapa-rotomy.

Table V includes cases of ovarian cysts. Cases 1 to 5 were uncomplicated and showed no leucocytosis. Case 6 was a small cyst that had ruptured, but had caused practically no leucocytosis. Cases 7 to 12 were cases of suppurating ovarian cysts, leucocyte counts varying from 9,000 to 26,000. Case No. 13 was an ovarian cyst with a twisted pedicle and a leucocytosis of 18,800. Case 13 was an inoperable malignant papilloma involving the pelvic organs and had a leucocytosis of 9,000.

Conclusions from Table V. Ovarian cysts without complications do not cause a leucocytosis. If the cyst becomes infected or if the pedicle is twisted, interfering with its blood supply, there may be a leucocytosis up to 26,000.

24 West Fiftieth Street.

THE CLOSING OF VESICOVAGINAL FISTULÆ.

BY
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(With six illustrations.)

THE flapsplitting operation for vesicovaginal fistula was such a great advance over the old method of bringing edge to edge (where, indeed, it is a wonder that it ever succeeded) that further development of the new method seemed to stagnate, and it has remained in about the form in which it originated. But the improved ways in which coaptation is made in other regions, as in hernia, intestinal suture, etc., has led the writer to apply these to the operation under consideration, and in the following manner:

The first step is, of course, the separation of the two mucous membranes, half a centimeter at least from the fistula on all sides. To facilitate this, especially if the fistula is small, a longitudinal incision (or one in another direction would do if ureters, etc., are avoided), is usually made through the vaginal mucous membrane as in Fig. 1 or Fig. 2. The separation can be best begun, if the fistula is large, by a scalpel and continued by a blunt instrument or the finger; if the fistula is minute, all may be done by blunt dissection. Previous operations leave more work to be done by the knife, but they do not add to the difficulty as much as would be expected.

The bladder wall is now brought together, outer surface to

outer surface, by a continuous mattress suture of catgut, of course not penetrating the mucous membrane of the bladder (Fig. 3). The suture is continued beyond the length of the fistulous opening nearly to the extent of the vaginal incision. This is to adjust the two wounds one to the other and make one suture take from the other what tension there may be. This suture is placed as far back from the edge as the dissection has uncovered. The edges of the bladder are by this suture turned in, as in Fig. 5, and by testing hydraulically will be found to resist considerable pressure, for the fluid pressure being perpendicular to the surface, tends somewhat to press the surfaces together. The catgut used is one

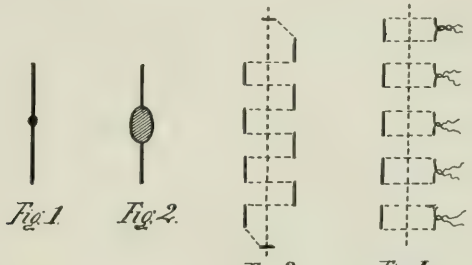


Fig. 1 Fig. 2. Fig. 3. Fig. 4.

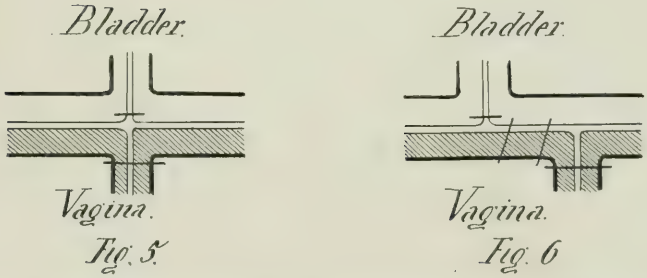


Fig. 5. Fig. 6

which will last about ten days and as fine as can be without cutting out, about No. 0.

The vaginal membrane is now brought together by interrupted mattress sutures placed to bring inner surface to inner surface, as in Fig. 4, the final result being as in Fig. 5. No. 0, or catgut a little thicker, may be used here. In some cases both of these lines of suture could be doubled if thought desirable. The vagina is now moderately packed with wool wrapped in iodoform gauze, and the bladder drained. The latter requirement is not so easily attained as it might seem. It is best done by a soft male catheter without wings, for these are not reliable for keeping the eyelets

entirely within the bladder. It is kept in place by passing it through a rubber disk, and this disk is easily bound against the vulva by a split T bandage. The catheter must have sufficiently thick walls or it will kink either above or below the retaining disk; it must also be removed occasionally to free it from obstruction, and irritating concretions.

In the following cases this method has been found satisfactory:

Fistula of several years standing, made for drainage, in a healthy woman of middle age; has resisted five operations in the hands of two well-known surgeons; minute at the time of last operation; prompt healing.

Fistula nearly 1 centimeter in diameter in a healthy young woman, from protracted labor; early healing after a few drops of leakage, the catheter having been used intermittently.

Fistula nearly 1 centimeter in diameter, in a frail old woman, who had had much disease of bladder and ill health; from operative drainage; at the time urine and general health good; some leakage from obstructed catheter; early healing.

Minute fistula in old woman, following hysterectomy; resisted four operations; a few days of leakage because of misplaced catheter; healed in two weeks.

With continuous drainage, these leaks would not have occurred.

In certain cases of tension the two lines of suture could be made at right angles to each other, and in large defects the membranes could be slid so that the apertures do not correspond, and this could be maintained, after denuding farther than usual, by passing the vaginal sutures into the bladder walls, or better by passing extra sutures from the vagina into the bladder walls, as in Fig. 6, using either one or both of these oblique (mattress) stitches.

These maneuvers are similar to those of Dr. V. Pauchet of the French Obsteterical and Gynecological Society, noted in the *International Journal of Surgery* for June, 1904, but published two years later than the above cases. He separates the viscera over a wide area (presumably where there is a large defect) in consequence of which "the margins of the fistula adhere almost of their own accord." A single purse string suture is placed near the bladder edge, and if this aperture corresponds with the opening in the vagina, it is drawn under one vaginal flap by a single suture. But one vaginal suture is used in order that there may be drainage. Time must show whether it is better to drain the space between the viscera or obliterate it, as the writer has attempted to do, but

it would seem that where possible the latter would be the safer way.

An advantage in these, as in most flap-splitting operations, is that no tissue is removed and they may be done again and again without having a larger and larger aperture each time to deal with. Another advantage is that they may be applied to other hollow viscera, as in rectovaginal fistulæ. A disadvantage which might be claimed is the failure to cover both surfaces with mucous membrane. Such objection, it is believed, is theoretical rather than practical, for if the broad, raw surfaces, held together by mattress sutures, keep out the urine the two mucous membranes will take care of themselves.

It is a mistake to assume that very small fistulæ do not require radical procedures; they are probably lined by mucous membrane.

THE ANATOMY OF A CASE OF TUBAL PREGNANCY.*

BY

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Washington, D. C.

I AM indebted to Dr. W. A. Warfield, Surgeon-in-chief of the Freedman's Hospital, for the opportunity to study and report upon this specimen. It was removed by him April 16, 1905.

Description of the Specimen.—Seven centimeters of the right Fallopian tube, tortuous and somewhat thickened; the free end evidently severed near its attachment to the uterus. The ampullary portion expands abruptly and forms the gestation sac. I can find no trace of the fimbriæ or ovary. When the specimen is held in its normal position, a solid ovoid mass 11 by 8 by 9 cm. is seen within the ampullary portion of the tube. On the posteroexternal aspect of this mass is situated a thin-walled cyst whose volume is greater than the solid mass. The sac wall is 4 mm. thick, having several thin-walled (1 mm.) sacculations. The interior of the sac is incompletely encrusted with a granular material. Externally there are a few severed peritoneal adhesions. The amnion is easily stripped from the chorion of the sac and placenta.

The solid ovoid mass is the placenta, into the edge of which the umbilical cord is inserted. Between the placental substance and the

*Read before the Washington Obstetrical and Gynecological Society, May 5, 1905.

sac, numerous blood clots varying in size are seen, the largest being one centimeter in diameter. The fetus is a female, 25 cm. from bregma to heel (after preservation in formaldehyde), has hair, and the finger nails extend beyond the epidermis, from which I judge it to be five months' gestation.

The specimen, after removal, was placed in formaldehyde solution in which it remained until portions were taken for embedding. Certain portions do not take the stain well, *e.g.*, the fetal structures, the amnion, and the chorion of the sac wall, as well as the entire placenta; likewise the blood of the maternal sinuses. The tubal portion of the sac and the ovary stain well. From these facts I conclude that the fetus had been dead some days when removed.

Microscopical Examination.—The outer third of the sac wall is composed of edematous connective tissue, having a fibrous stroma and a moderate number of variously shaped connective tissue cells. There is no regularity of either the fibers or the cellular elements. This portion stains normally. The peritoneum has been lost in preparation. The middle third is made up of a dense mass of white fibers matted together, but arranged mostly parallel to the surface. The inner third is fibrous tissue holding on its inner surface the chorion and amnion. The amnion is somewhat altered, the epithelium being swollen and in places cast off. The epithelial layer of the chorion is irregular in thickness and in most places displaced by fibrous tissue. The cells of the amnion and chorion stain very faintly with both hematoxylin and eosin.

A section through the sac opposite the center of the placenta shows the outer portion to be a rather thick strip of ovarian tissue changing more or less abruptly into a dense wall of fibroblasts which are arranged parallel with the surface. Internal to this is a less compact layer of varying thickness which sends processes into the blood spaces. It is made up of mucous cells, small round cells, spindle cells, and a few leucocytes, which are seen in the blood clot diminishing in numbers towards the center. The large septa of the placental chorion pass to and into the tissue last described. Between these septa are seen the villi surrounded by blood clots.

The fetal surface of the placenta shows some changes. The amnion is nearly normal, the epithelial cells are swollen. The epithelial layer of the chorion is thin, and the layer of canalized fibrin is thin and in places wanting. I find no evidence of a tubal decidua, either at the placental site or at a point opposite to it.

The central portion of the placental mass is composed principally

of coagulated blood. Chorionic villi are present at intervals throughout the mass; chorionic partitions are less abundant.

Conclusions.—The impregnated ovum lodged in the ampulla, the mucous membrane of which had undergone congestion, and hyperplasia of the tunica propria followed. The villi of the chorionic sac penetrated the tunica propria and possibly the muscularis as well, and soon established an intimate connection with the dilated blood vessels. The muscular wall of the tube became thickened from congestion, edema and hypertrophy of the muscle cells. Connective tissue cells lodged among the fibers and developed into white fibrous tissue, thus adding to its strength and thickness. Later on the muscle cells were entirely replaced by fibroblasts. As the embryo developed the amnion and the chorion became fused with the tube wall, the epithelium disappeared, as well as the muscle fibers, leaving a fibrous sac lined by the bag of waters. As the tube enlarged, the layers of the mesosalpinx separated and finally the ovary became adherent to the sac, spreading out upon its surface as further growth took place.

FUNDAL, INCIDENTAL AND CERVICAL UNAVOIDABLE HEMORRHAGE; NEW DESCRIPTIVE TERMS FOR THE TWO TYPES OF ANTE-PARTUM HEMORRHAGE FROM PLACENTAL SEPARATION.

BY

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An experience of six years as a teacher of obstetrics has convinced me that it is high time to use new terms to denote these two forms of hemorrhage. Despite careful teaching, and frequent reiteration, every year candidates for graduation come to the green room with poorly defined ideas as to the fundamental points of difference between hemorrhage from placenta previa and from a normally located placenta. There was marked improvement this year, as only three out of a class of sixty failed to differentiate the two forms. Nor is this failure to differentiate confined to medical students. But recently a distinguished obstetrician from this section of Tennessee, in an article entitled "The Management of Hemorrhage in Obstetric Practice," entirely ignores the hemorrhage from the detachment of a normally located pla-

centa, contenting himself with describing the management of the hemorrhage of abortion, placenta previa and post partum. Recent reliable statistics show that hemorrhage from a normally located placenta is of more frequent occurrence than hemorrhage from placenta previa. This confusion is not surprising when it is taken into consideration that the descriptive terms "accidental" and "unavoidable" are defective and misleading to a great degree. Rigby's seventeenth century definition of placenta previa has never been improved, *i.e.*, "the attachment of the placenta to that portion of the uterine wall which always dilates as labor advances." But he was not nearly so fortunate in the descriptive names which he gave to these conditions. "Unavoidable," to denote placenta previæ hemorrhage, is fairly appropriate, though both hemorrhages in one sense are strictly unavoidable. The word "accidental" is peculiarly unfit and inadequate. It has proven a stumbling block to thousands of medical students. There is absolutely nothing in these two terms to denote or even suggest the cardinal point of difference in the two forms of hemorrhage. Actual experience has amply demonstrated that it is very difficult for the medical student to disassociate accidental hemorrhage from trauma, as the term would indicate.

Several suggestions have been made by writers of recent years to improve the nomenclature of the subject. But these newer terms are open to the very same objection—the distinctive point of difference is not indicated. This distinctive point is *placental location*. It is unfortunate that our text-books do not emphasize this point. With the idea of meeting this prerequisite, I have coined the expressions "cervical unavoidable" and "fundal incidental," to denote the hemorrhages of placenta previa and from a normally attached placenta, respectively. Advantages claimed for these two terms are:

1. Anglo-Saxon words are employed.

2. The fundamental point of difference, placental location, is indicated.

3. The deceptive, misleading term "accidental" is avoided.

The objection may be raised that the placenta is but rarely attached directly in the fundus, and it is an open question as to whether or not it is possible for the placenta to be attached to the mucous membrane of the cervix.

But it would seem that the words fundal, cervical—diametrically opposites—convey accurately my meaning—*not* specific attachment, but general direction.

In reality, the hemorrhage of abortion is necessarily either fundal incidental or cervical unavoidable. If the placenta is normally situated, the hemorrhage is fundal incidental, whether at the second month or the seventh. If the location is below Bandl's ring, in the dangerous zone, the hemorrhage is cervical unavoidable, whether at the third or the ninth month. It is entirely probable that in many cases of early abortion with severe hemorrhage, sharp, ineffective pains, and undilated os, that the placenta is previa, and nature is performing a physiological abortion.

I offer these terms to the profession with the hope that they will prove more satisfactory than the former misleading, inadequate terms.

In a personal letter, Dr. J. Clifton Edgar says that he considers my classification "Fundal Incidental" and "Cervical Unavoidable" a good way out of the present confusion of terms.

CHRONIC INTERSTITIAL MASTITIS.*

BY

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EXCLUDING syphilitic and tuberculous imflammations there are two distinct types of chronic mastitis, one caused by a low grade of infection with more or less attenuated pus-producing organisms, and another, in which there is no apparent infection, which is much slower in development, and is characterized by increased formation of interstitial tissue and small cysts. The first is usually characterized by some redness and tenderness and eventually results in the formation of an abscess or abscesses. It may occasionally result in resolution and is really a subacute inflammation. True chronic mastitis has been called chronic mammary tumor by Sir Astley Cooper; partial hypertrophy, by Velpeau; chronic interstitial mastitis, by Virchow; chronic cystic mastitis, by König; cystic disease of the breast, by Réclus; cystadenoma, by Schimmelbusch, and other names by other writers. There is also much variation in the descriptions given by different authorities of the etiology, clinical history, pathological anatomy and prognosis of this affection. König believes

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that the disease begins in the ducts of the gland, because at no stage of the disease is the interstitial tissue alone involved. Schimmelbusch believes that the first change is an overgrowth of the epithelial cells of the acini, and not a dilatation or obstruction of the ducts. According to Von Bergman, Roloff agrees with König in considering the process inflammatory, but believes with Sasse that the microscopic picture is by no means uniform. Sasse, who examined a large amount of material, concluded that both conditions could be present. Tietze claims that it is impossible to distinguish sharply between cysts with and without papillary elevations or adenomatous growths of the cyst wall. He considers the cystadenomata of Schimmelbusch as due to proliferation of the epithelial cells of the alveoli, forming epithelial papillæ with or without connective tissue, then glandular tabes and finally carcinoma. W. Mintz and Virchow consider the condition as due to interstitial connective tissue hypertrophy. Cysts, according to Schimmelbusch and König, are always present; according to Virchow, Dennis, Sasse and others they are often absent. The reason for this confusion is the fact that the condition cannot be detected and examined in its incipiency, and those who claim that increased formation of interstitial tissue is at no stage of the disease the only condition present, have never examined a case in its beginning. Such a thing is impossible, because the condition could not be recognized in the very beginning even if accidentally examined in postmortem work. In later stages the pathological changes are well marked and easily recognized.

Dennis[1] says: "The lobules appear white and glistening upon section, the fibrous induration is infiltrated with leucocytes. There is also present débris composed of epithelium that has undergone fatty degeneration. This growth often forms the nucleus of a carcinoma. Chronic interstitial mastitis may be circumscribed or diffuse. In the latter form there is a rich development of fibrous tissue. Cysts are often formed in the meshes of the fibrous tissue. In the circumscribed variety nodules about the size of a hickory-nut are found interspersed between the normal gland lobules."

This is a fairly good description of the condition, as I have observed it in a number of cases. The pathological process I believe begins in the majority of cases at least in a reflex hyperemia of the breast, due to uterine irritation. This leads to proliferation of the interstitial connective tissue of the breast. The

pressure of this newly-formed connective tissue causes obstruction of the glandular tubules and causes retention cysts. These cysts naturally contain accumulated epithelial cells, some of which undergo fatty degeneration. Later these cells are absorbed and leave cysts filled with greenish brown fluid. This peculiar color probably comes from decomposed hemoglobin, from blood cells that have been caught in the meshes of proliferating connective tissue.

Schimmelbusch speaks of this dark fluid as characteristic. The disease is, in my experience, nearly always bilateral and diffuse, though it may be circumscribed or unilateral. When circumscribed, it is said to be most frequent in the outer or upper segment of the breast.

There is much confusion in regard to the etiology. Most authors begin by saying that it is most common in married women about the menopause and wind up by intimating that it is most frequently seen in single women and young girls.

Dennis[1], for example, says: "Chronic interstitial mastitis is a form of inflammation usually affecting the outer half of the breast, and is generally observed in married women who have reached the menopause, or between the ages of forty-five and fifty. It is seldom seen in young women." Later, in the same article, he says: "Celibacy has been assigned as a cause, by Robinson, who states that 'of 17 cases 12 were in single women; of the 5 married 3 were sterile, 1 had 4 children, and the other not known'." Von Bergman[2] says it is more common in married women who have not nursed children; and later, in describing a typical case, he says: "Especially in young girls during the menstrual period one or both breasts become swollen and painful. This diminishes after the flow ceases, but small nodules remain that feel leathery and fibrous, or may be a flat, disc-like area of infiltration."

I have notes of 18 cases upon which I have operated. Of these 10 were single; 6 were married nullipara, and two had borne children. Of the single women, 8 were between 18 and 25 years of age, and two between 40 and 45. Of the married women, 6 were under 30, one 40, and one 60 years of age. All of the single women had dysmenorrhea, and exacerbations of pain and swelling in the gland at the menstrual epoch. One was a nymphomaniac, and had never become pregnant though she feared at one time that she was so.

I have seen as many cases upon whom I did not operate, and

while I have no record of these my impression is that most of them were young single women, and that most of them suffered from dysmenorrhea, due probably to anteflexion of the uterus. There is little doubt in my mind that chronic interstitial mastitis is due in most cases to a reflex vascular change in the breast caused by uterine irritation. But it may also result from local traumatism or follow infectious inflammatory conditions in the breast. It is generally bilateral, though generally much more pronounced and advanced in one breast than in the other. The typical picture is of a girl of 18 or 20 years, with dysmenorrhea, who begins to have some pain and swelling of the breasts at the menstrual period. After a few months small nodules are discovered. Sometimes only one or two can be felt, sometimes they are numerous and scattered through both breasts. These nodules grow slowly and seldom reach a size greater than one inch in diameter. But they constantly increase in number, and in this way the breast may become considerably enlarged.

Even where only one or two distinct nodules are felt, however, if an attempt is made to remove them bands of dense fibrous tissue will be found radiating from the nodules into all parts of the breast. In the first case in which I attempted to remove a single painful nodule of this character, I was surprised to find these bands radiating in every direction like homogeneous continuations of the nodule, and in tracing them up and removing them I removed the whole gland.

There is no redness of the skin. The nodules are freely movable. The axillary lymph nodes are not enlarged, unless they become accidentally enlarged from some other cause or from a subacute infection complicating the chronic condition.

Sometimes there is no pain, and sometimes the pain is confined to a single nodule larger and harder than the rest. When there is no pain the discovery of the lumps is the first thing to call attention to the condition. In some cases the condition remains practically unchanged for years, and in exceptional instances women go on to old age with chronic interstitial mastitis without great discomfort. In other cases the pain is severe, particularly at the menstrual epoch and carcinoma not infrequently develops, about the menopause or earlier.

There is little danger of malignant change taking place before the age of 25, but after that the danger increases with every year.

The diagnosis of chronic interstitial mastitis is usually easy, from the multiple nodules and the usual bilateral nature of the

disease. König says that the nodules can be distinctly felt by lateral pressure between thumb and finger, but are not felt if the palm of the hand is pressed on the breast or if in any way pressure is made from before backward on the gland. He considers this diagnostic. Sometimes, by firm pressure on a cyst, some of the dark fluid may be expelled from the nipple. Even when but a single nodule is large enough for distinct palpation the peculiar feel of leathery bands of fibrous tissue may be detected in the rest of the breast. In this way the single nodule may be distinguished from a simple benign cyst or adenoma.

From malignant tumors it is easily distinguished by the lack of any tendency of the nodules to become adherent, by the softer feel of the fibrous infiltration, and lack of enlargement of lymph nodes.

The prognosis depends upon the danger of malignancy developing in the growth and upon this point there is wide variation in the opinions of different authorities. Sir Astley Cooper, who was one of the first, if not the first, to describe this disease, considered it absolutely benign and thought surgical interference entirely unjustifiable. Von Bergman, in his latest text-book of surgery, advises operation only in exceptional cases. He admits the danger of malignant degeneration, but apparently thinks it time enough to operate when the earliest manifestations of malignancy appear. Dennis says, "The tumor usually enlarges until, by its pressure effects pain, sloughing, and ulceration follow; and in these cases in which such a termination is not prevented by operation, carcinoma is likely to develop in the nodules." I think when ulceration occurs, carcinoma has already developed. In my experience, chronic interstitial mastitis does not cause excessive enlargement of the breast, and the nodules show no tendency to sloughing until after malignant change has occurred.

If the views of König, Schimmelbusch, Sasse, and others are accepted, the affection is of epithelial origin, and has at least a strong malignant tendency from the first. Tietze evidently regards it as pursuing a steady course from its inception toward carcinoma.

Personally I am inclined to the view that these nodules begin with proliferation of connective tissue, and that retention cysts are developed later. But there is much and constantly growing evidence to show that retention cysts in glandular organs are very frequently the starting point of carcinoma; if, indeed, this is

not the usual way in which such carinomata begin. In a paper before this society, May 19, 1899, I gave a theory of the origin of carcinoma which I have still no reason to change. The gist of it is that we have only to deprive epithelial cells of their normal nerve control to have a wild growth of these cells, that is practically carcinoma. Whether the nerve influence is cut off mechanically by fibrous tissue proliferation or by chemical intoxication of the terminal nerve fibers with bacterial products, the result is the same: we have a mass of embryonic cells left free to proliferate in a disorderly manner. Such a group of cells will invariably cause carcinoma unless held in check by some of the other resources of nature such as walling off or enclosure in a connective tissue capsule. In retention cysts we have just such masses of cells. The cyst wall controls them for a time, often for years; but there is always danger of such cells infiltrating the cyst wall and finally escaping. The manner in which this may be done has been shown by numerous pathologists. There are, perhaps, several ways; but one of the more common is by the formation of epithelial papilli on the inner wall of the cyst. These papilli increase in size, become glandular adenomata, and then adenocarcinomata.

Whatever theory we may accept, or whether we hold to no theory at all, it is evident from microscopic findings that there is, in chronic interstitial mastitis, a condition favorable for the development of carcinoma, and clinical histories show that this change actually occurs with a frequency that is far too great to be accounted for by coincidence. Personally I believe with König, Sasse, Ruloff, and Tietze that the malignant element is there in a very early stage of the disease, and that while it may be held in check for a long time, it will in the majority of cases predominate in the end. The malignant change may occur while the growth is small and ill-defined, and there is no way of telling how many cases of cancer of the breast originate from unnoticed chronic mastitis.

The prophylactic treatment should receive more attention than it is at present accorded. Uterine conditions causing irritation and dysmenorrhea in young girls should be corrected whenever it is possible. Anteflexion and cervical stenosis especially should be corrected, by surgical means if necessary. These condition not only are the most frequent cause of mastitis in girls, but also frequently cause cystic degeneration of the ovaries and salpingitis. Even when nodules have formed in the breast,

relief of uterine disorders may cause arrest of the growth. I have seen at least two cases in which correction of anteflexion of the uterus has been followed by almost complete disappearance of distinct nodules of chronic interstitial mastitis. The relief of breast symptoms was so prompt in these cases that there is hardly any doubt as to cause and effect. The breasts that had been swollen and painful during the periods of dysmenorrhea remained normal during menstruation as soon as the dysmenorrhea was relieved, and the nodules in a few months almost entirely disappeared.

After the condition has become established and well marked, in women of 30 years or more, the breast should be amputated. If this be done before the occurrence of visible malignant change no fear of recurrence need be felt. No other treatment is in any sense curative.

In women under 30, or certainly in those under 25 years of age, we may afford to temporize, unless the advanced stage, great pain, or other conditions make removal of the breast necessary.

The loss of one or both breasts in a young single woman is a serious consideration, and as the danger of malignancy at this age is very slight, operation may often be delayed for 5 or 10 years when the loss of the gland will not be so serious a handicap.

In many cases the pain is felt in a single nodule larger and harder than the rest. In such cases I think that removal of this single nodule is proper. In such cases, and when operation is postponed, it is not usually necessary to alarm the patient or even to tell her that operation will be necessary at some later date, but she should be instructed to return for examination upon a recurrence or exacerbation of the pain or increase in the size of the growth.

In some cases where I have advised delay I have been obliged to operate because the patient was becoming seriously neurasthenic from over anxiety, and in other cases where I have advised operation it has been refused. So that the disposition of the patient may be a prominent factor in the treatment. When for any reason operation is not done, much relief may be given by supporting the breast with a snug bandage or corset or by a pad fastened in the corset. In all cases, whether operated upon or not, if one breast is still unaffected every effort should be made to get the uterus and pelvic organs into a healthy condition in order to prevent the sound breast from becoming diseased.

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MORTALITY IN OPERATIONS UPON FIBROID TUMORS OF THE UTERUS.*

BY
J. M. BALDY, M.D.,
Philadelphia.

(Concluded.)

TABLE OF OPERATIONS.

I.

Year.	*Total.*	*Deaths.*
1896	7	2
1897	12	1
1898	24	5
1899	21	5
1900	22	2
1901	36	3
1902	37	0
1903	35	3
1904	45	0
1905	11	0
	250	21

Total operations to March 1, 1905, 248. Mortality 8.4 per cent.

II.

	Total.	*Mortality. Per Cent.*
Supravaginal hysterectomy	219	9.21
Abdominal myomectomy	11	0.00
Panhysterectomy	14	7.14
Vaginal hysterectomy	3	0.00
Vaginal myomectomy	2	0.000
Vaginal myomectomy (Downes)	1	0.00
	250	8.4

Last 105 operations gave 3 deaths, a mortality of 2.85 per cent.

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TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of May 9, 1905.

The President, J. Riddle Goffe, M.D., *in the Chair.*

Report of a Successful Case of Multiple Myomectomy in a Pregnant Woman.

Dr. A. Brothers.—Through the courtesy of a physician of this city, Mrs. A. L. was placed under my care on April 7, 1905. From my history book I extract the following notes: She is 26 years old and married five weeks. She has never been ill, never missed her period by a day until the present time, and is now overdue at least two weeks. She was last unwell 45 days ago. She is slightly built, with breasts suggestive of pregnancy. For the past three weeks she has lost her appetite and suffered from nausea nearly every morning. About this time (or two weeks after marriage and corresponding to the normal date of her menstrual flow) she developed pelvic cramps and thought she was about to be unwell. There was, however, no show of blood. She consulted a physician on account of the abdominal pain and he told her that, besides being pregnant, she carried a large tumor. At that time the pain was on both sides of the abdomen. Since then the pain became localized in the right side and is worse on walking or standing. A second physician also recognized the presence of a tumor, and attempted to relieve her by the use of an ointment. A surgeon was now seen, who advised her to have an operation done, but told her that her womb must be removed and that she would never have children. She next consulted the physician above referred to, who, without offering an opinion, referred her to me.

Physical Examination.—The abdomen protrudes in the erect position, but flattens out in the horizontal decubitus. The breasts show discoloration and papules suggestive of pregnancy. The labia are darker than natural. On the right side of the abdomen is felt a large hard tumor, protruding beyond the median line and well up toward the liver region. It shows a certain amount of lateral mobility. Bimanual examination fails to clearly differentiate the uterus from the tumor, but to the left and behind the cervix a second hard tumor, the size of an orange, is felt pushing down the cul-de-sac of Douglas and the vaginal roof. This second tumor is clearly defined from the uterus and possesses a certain degree of upward mobility. Neither the right nor the left adnexa can be mapped out.

Diagnosis.—Early pregnancy, complicated by two uterine fibroids.

The patient's husband showed distinct evidences of disgust with the result of the marital venture already manifest in the honeymoon period, and promised to have nothing to do with her if she were to become a childless wife. The large right-sided tumor showed signs of twisting of the pedicle, possibly as the result of disturbances brought on during sexual intercourse. The smaller left-sided tumor threatened impaction in the pelvis, with possible later serious obstruction to labor. The question of inducing abortion occurred to me, but was dismissed as offering no guarantee against exactly the same state of affairs recurring sooner or later, and, under no circumstances, effectually disposing of the root of the evil. To allow pregnancy to proceed to term and then trust to the possibility of pushing the left tumor upwards and out of the pelvic cavity seemed wrong, because the tumor could not be pushed up very far at this early stage of pregnancy. Cesarean section, or the Porro operation, offered reasonable hope to both mother and child at the end of pregnancy provided the woman did not spontaneously abort before this time. On the other hand, with such large tumors present in the first weeks of pregnancy, there was no determining how large they might grow (according to well recognized rules) during the ensuing eight or nine months. To operate now meant the possibility of (1) a successful myomectomy not disturbing pregnancy. (2) A successful myomectomy followed by abortion resulting from the trauma to the uterus. This contingency, however, permitted of the possibility of subsequent impregnation in a uterus freed of its tumors. (3) There was the possibility that conditions at the time of operation might indicate a total hysterectomy, followed by necessarily permanent and hopeless sterility. After thoroughly considering and digesting the various phases of the case, I decided that the best course to pursue was to operate—to do a myomectomy if possible, a hysterectomy if necessary. The case was squarely stated to the woman and to her relatives, and she decided on the operation.

On April 20, in the Trendelenburg position, the abdomen was opened, and on the right side was found a large myoma, with a pedicle showing beginning torsion and attached to the right cornua of the uterus. The tube and ovary on this side were normal. The tumor was amputated, the vessels of the pedicle were independently secured and the two edges of the cut pedicle approximated and secured by suture. The left tumor was brought up out of the pelvis and removed in the same way. From the circumstance that the tube but not the ovary of this side could be found, I am inclined to the belief that this was a fibroma of the left ovary. The pedicle was particularly long and seemed to lead to the right side (not the horn) of the uterus and was situated posteriorly. I removed four smaller sessile fibroid tumors varying in size from that of a grape nut to that of a walnut, and situated in various

parts of the uterus wall, the most difficult of removal being located in the lower posterior uterine wall. Some of the tumors were at quite some depth in the uterine wall and left beds, which had to be carefully sewed over in order to secure against possible secondary hemorrhage. The uterus was enlarged and soft, and had the usual appearance of the pregnant uterus.

The patient made an uneventful recovery. She left her bed on the fifteenth day and went home on the eighteenth, complaining only of morning sickness.

Dr. J. Riddle Goffe.—While many men speak of the condition reported as that of fibroids complicated by pregnancy, I think it more correct to speak of it as pregnancy complicated by fibroids. It is usual to think of a normal condition being complicated by a pathological, rather than vice versa. Therefore, I believe the correct expression would be "pregnancy complicated by fibroid tumors."

Dr. Henry C. Coe.—I have seen three cases of pregnancy complicated by fibroid tumors within the last four weeks, in each of which the indications for treatment were different. In one the indication was clear, to empty the uterus, as the case was practically one of incomplete abortion at the third month. In the second case the patient was absolutely well, and pregnancy had proceeded normally to the fifth month. Suddenly she was seized with pain in the abdomen, and noticed for the first time a large lump above the symphysis in the median line. The doctor in attendance thought that the uterus was asymmetrical. Evidently there was a subperitoneal fibroid tumor the size of a grape-fruit, which had suddenly slipped out of the pelvic cavity. When I examined her I found the fetus situated high up, but I prophesied that she would be able to go the full term if the presenting part slipped past the tumor, which it has since done. There seemed to be no reason to interfere. In the third case (multiple fibroids) I advised waiting until full term, and then doing a Cesarean section and supravaginal amputation, as the size, number and location of the growths rendered it improbable that the woman would be delivered normally. When these patients are only five months advanced in pregnancy, I think it is better to allow them to go to full term if possible, and then to do a Cesarean section, than to empty the uterus, losing the child and jopardizing the life of the mother as well.

Dr. R. A. Murray.—It is the consensus of opinion in the papers presented on this subject during the last ten years that the emptying of the impregnated uterus in the presence of uterine fibroids is really a very serious affair, many such patients dying of sepsis, even in the hands of the best and most painstaking men. Unless it is done early, the fibroid will grow so rapidly during pregnancy that it is better, in the majority of cases, rather than to empty the uterus at the fifth month, to allow them to go to full term, unless the fibroid is very slightly attached to the uterus when enucleation should be done. In a case reported by Bland Sutton, he

enucleated some fibroids from the uterus at the fourth month. He thought he had entirely removed the tumors, but, when examined at term, the uterus was found to be almost one mass of fibroids. In a case I have in mind, where I believed the patient could live but a short time if left alone—the fibroid was between the uterus and bladder. I attempted enucleation, but opened the cavity of the uterus and then did a hysterectomy. That patient to-day is absolutely well. I think the point should be more emphasized that when pregnancy is complicated with fibroids and we decide that the case can go to term, we should not think of causing a miscarriage; it is bad practice, for such cases have very stormy times and many die. The general practitioner should be told that such cases should be under the care of a man who is competent and prepared to do a hysterectomy or Cesarean section. Even after delivery there is danger still of sepsis from necrosis of the fibroid. If enucleation is possible a myomectomy should be done at the fourth or fifth month.

PAPILLARY CYSTOMA OF OVARIES.

Dr. H. J. Boldt.—At the last meeting of the society, I had the pleasure of presenting specimens of adenocarcinoma of the ovaries, metastases in the omentum, broad ligaments and intestines. The patient at the present time is in excellent condition. The specimens submitted now are from a patient, Mrs. H., who had no complaint whatever, and came for examination only because she had not menstruated and was desirous to know whether she was pregnant. The examination revealed the presence of the neoplasms presented. Recovery was uneventful and the patient was out of bed in a week and left for her home on the thirteenth day.

Microscopical Examination.—The specimens, on microscopical examination showed a tumor formation, the characteristic features of which are irregular cysts or cavities surrounded by trabeculæ of fibrous tissue. The fibrous bands are, as a rule, narrow and composed of rather loose connective tissue, and except in a few places showing very few blood vessels. From the surface of these bands there extend into the cavities small proliferating papillæ of varying lengths, dividing, or partly dividing, the cysts into smaller or secondary cysts. Covering the surfaces of the trabeculæ and the papillæ and forming inner lining of the cysts is a layer of epithelium. The latter is tall, and, on the whole, stratified in type, but the cells do not stain well, show few nuclei, and are apparently degenerated. The cavities themselves vary much in size and are filled with necrotic material, showing a small amount of cellular material. Here and there are a number of leucocytes and small collections of pigment due to old hemorrhage. Of the two specimens submitted, one is made up of almost entirely necrotic matter, the fibrous bands having broken down, leaving only few irregular cavities or acini. The other shows active proliferation and the papillomatous character of the tumor

is well shown on the borders. One corner is surrounded by a broad band of fibrous tissue, but no ovarian tissue is to be seen.

Diagnosis.—Papillary cystoma of ovary. These tumors have a marked tendency to carcinomatous transformation and are usually considered malignant.

DEGENERATING MYOFIBROMA; SUPRAVAGINAL HYSTERECTOMY.

Dr. H. J. Boldt.—At the January meeting of this society I presented a degenerated uterine tumor with the title of degenerated fibromyoma. The pathological report is so interesting that I may be pardoned for presenting it with a repetition of the history. E. G. consulted me May 19, 1904. She was 49 years old, married 22 years, had three children, her last 17 years old. Patient had a large abdominal tumor which had not increased in size during the last 12 years. At that time she consulted some of the most prominent gynecologists, and had been examined under ether, but was told that the operation for the removal of the fibroid would not be necessary, because at the climacteric it would probably decrease in size, and the metrorrhagia of which she complained would then cease; further, that the operation for its removal would be so serious that she would probably die as the result of the operation. During the past few months the patient had, however, become so weak, and so much pain was present in the abdomen, that she could not bear it. Gastrointestinal disturbances and cardiac palpitation had become additional symptoms of prominence. The diagnosis of degenerative changes in the tumor was made. A cachectic appearance was marked. Operation revealed many intestinal adhesions. It required a long time for the woman to sufficiently regain her strength to be about, and then she went to the country for about two months. She had fully regained her health. All former distressing symptoms had disappeared.

Microscopical Examination.—The appearance of the sections examined is that of a new formation, all of the sections showing exactly the same construction. The character of the structure at first sight appears much similar to that of a goiterous thyroid, being made up of large alveoli supported by fibrous trabeculæ, forming a rather coarse network. The alveoli are almost uniform in size and shape, round or almost so, and well distended with a homogeneous amorphous material, apparently mucilaginous substance. The supporting membrane consists of narrow bands of trabeculæ, of moderately fine fibrous tissue with a few small blood-vessels. On either side of these bands and forming the outer wall of the alveoli or cysts is a layer of cells, single columnar in type, tall, with well defined large nucleus at the outer or proximate attachment of the cell. This layer is arranged in very small rugæ, giving the appearance of minute papillae projecting to the extent of 20 to 25 mikrons towards the center of the alveoli. These papillæ are almost uniform in length, forming a cellular outer wall of the cyst of fairly uniform diameter, and in only one or two instances projecting well towards the other side and making a par-

tial subdivision. Smaller fibrous trabeculæ follow and support the papillæ. Within the alveoli just beyond the cell wall is quite a little cellular detritus, disintegrated cells and nuclei. The history of the case does not throw any light on the origin of the tumor. Its structure is much like that of a cystoma of the ovary, but differs in the extreme regularity of the alveoli, and the uniformity of the growth in every respect, features absent in any cystoma we have seen.

Dr. Boldt also showed a large number of other specimens.

ECHINOCOCCUS CYST OF LIVER.

Dr. H. C. Coe showed a specimen (referred to in discussion of Dr. Gibb's paper at the last meeting) which he had removed three weeks before, the patient making a good recovery. The condition was not diagnosticated before operation, nor could the tumor be felt, as it was situated below the right lobe of the liver and was no larger than a baseball. The patient's local pain was attributed to a movable kidney. While perforating nephropexy, a hard nodular mass was felt through the peritoneum in the region of the gall-bladder, which was thought to be a collection of gallstones. Hence the exploratory vaginal section and discovery of the cyst.

FIBROSARCOMA OF RIGHT OVARY WITH TWISTED PEDICLE, ASSOCIATED WITH ADENOCARCINOMA OF THE RECTUM; OVARIOTOMY FOUR MONTHS LATER, EXCISION OF RECTAL GROWTH PER VAGINAM, RECOVERY.

Dr. H. N. Vineberg.—This unusual association of a malignant growth of the ovary with a malignant growth of a different nature, in the rectum, presented the following history: Mrs. A., aged 32 years, married five years, was delivered by me of a female child December 4, 1902, the labor being normal. At my request, she came to my office January 23, 1903, for final examination. I found the uterus in good involution and in good position. Behind the uterus lay the right ovary, about the size of an English walnut, of very hard consistence, freely movable, and not at all tender. I did not see her again until October 1, 1904, after an interval of 21 months. She told me she had had a poor summer, had considerable pain in the lower part of the abdomen, and suffered considerably from bowel trouble, which manifested itself by a tendency to diarrhea, with more or less tenesmus and the passage of mucus with the stool. On examination I found a large, hard tumor the size of a fetal head, occupying the lower part of the abdomen. Behind the tumor and crowding the rectum lay the uterus. I diagnosed a solid growth of the right ovary and urged immediate removal. She consulted two prominent members of this society, both of whom had been previously informed of my observations and conclusions. They both diagnosticated a fibroid growth of the uterus, and while they thought operative interven-

tion might ultimately be necessary, they saw no good reason for haste in this case. In about four weeks the patient began to suffer from a rather severe attack of pain in the right side of the abdomen. From this I inferred that torsion of the pedicle had occurred, and deemed it a favorable occurrence, as it would determine the patient to submit to operation sooner. This was the case. The patient entered the private pavilion at Mt. Sinai Hospital and was operated upon by me November 10, 1904. There was a fair amount of free ascitic fluid in the peritoneal cavity, the tumor lay in front of the uterus and its pedicle had undergone one complete twist and a half. Dr. Mandelbaum, pathologist to the hospital, made a microscopical examination of the tumor and found it to be a fibrosarcoma, with a preponderance of the fibroid tissue. On the third day following the operation the patient had a temperature of 103° and a rapid pulse. Subsequent to this convalescence from the operation progressed satisfactorily. The patient, however, complained a great deal of bowel trouble, had more or less diarrhea with large quantities of mucus in the stools. At no time while she was in the hospital was any blood noticed in the stools. The condition was looked upon as that of enterocolitis in a decidedly neurotic individual, and after returning to her home she was placed under the care of her family physician. Before leaving the hospital the following note was made on November 28: There is a small mass felt behind the uterus, which may be either the left ovary or a small exudate. Irrigation of the rectum and starch enemata do not give much relief. March 13, 1905, I was called to see the patient at her home on account of the persistence of the bowel trouble, and because she had had an attack of hemorrhage from the rectum a few days before. On bimanual examination I could map out the same mass behind the uterus as I found before she left the hospital. The examination of the rectum with the index finger was negative. On the following day I made an examination with the sigmoidoscope at my office. Just beyond the third valve I saw an irregular growth, the size of a half mandarin orange, situated in the anterior wall of the rectum. The diagnosis of a malignant growth was made and immediate removal urged. She consulted a rectal specialist, who excised a small fragment of the growth and had it examined microscopically, and it was reported to be an *adenoma destruens*. The patient kept putting off the operation and did not submit to it until April 24, six weeks after the growth was first detected, and during which time it had grown considerably. The lower border of the growth was distant three and a half inches from the anus. I decided to save the sphincter, if possible, and to do a resection of the bowel with an end-to-end anastomosis. Briefly, the steps of the operation were as follows: (1) Transverse incision in posterior vaginal vault, then entering the peritoneal cavity, packing back the intestines with iodoform gauze. (2) Longitudinal incision of posterior vaginal wall from transverse incision to peritoneum and through it down to the sphincter, but not cutting it. Dissection of vaginal wall from rectum and freeing

the rectum from its posterior attachments. (3) Division of rectum about two and a half inches from anal margin, bringing down the sigmoid portion until the growth was delivered and the rectum could be divided about an inch above the growth. (4) Suturing together of the sigmoid and anal portions of the rectum with silk sutures, the knots being tied within the bowel. The lumen of the anal portions was considerably larger than that of the sigmoid portion, and a fold had to be taken in the former. Although the patient was rather delicate and anemic, she withstood the operation fairly well. It is now two weeks since the operation, and convalescence is progressing nicely. There is quite a large fistula, through which as yet most of the feces escape, but a fair amount comes through the anus, and the patient has perfect sphincteric control. Should the fistula not close spontaneously, I will repair it at some future time. The growth removed was about the size of a hen's egg. It almost completely encircled the lower lumen of the bowel. Dr. F. S. Mandelbaum reports it to be an adenocarcinoma.

LARGE MYOFIBROMA OF THE UTERUS, COMPLICATED BY FIBROSARCOMA OF RIGHT OVARY.

Dr. H. N. Vineberg.—This case is of interest as showing the rather rare complications of a solid growth of the ovary with a fibroid growth of the uterus. The patient was 49 years of age, married 25 years, had three children and several miscarriages. Seven years before a growth of the uterus had been detected. This growth had increased very much in size during the past few years. Her chief symptoms were a feeling of weight in the abdomen, which extended to both lower extremities, and marked fatigue on the least exertion. Menstruation was very profuse unless she remained perfectly quiet. On examination, a hard nodular tumor was detected, reaching to very near the border of the liver on the right side. In the median line it extended to midway between the umbilicus and ensiform cartilage. The cervix was pushed up beyong the reach of the examining finger by a large, hard, smooth tumor, which filled the true cavity almost completely and almost obliterated the lumen of the rectum. This tumor, which proved to be that of the right ovary, was looked upon as a pedunculated fibroid. It was singular that, notwithstanding the size and position of this tumor, the patient made no complaint of pressure symptoms of the rectum or bladder. The uterine growth proved to be a myofibroma, while that in the ovary was a fibrosarcoma. The patient made a rapid and uneventful recovery.

Dr. H. C. Coe.—My experience with fibrosarcoma of the ovaries shows that they are comparatively benign and are not likely to return if removed early.

Dr. J. Riddle Goffe.—With reference to Dr. Vineberg's method of dealing with the sphincter, I have employed the same method since 1894, when I performed it on a man, doing a Kraske operation, cutting away five inches of the rectum and leaving the sphincter intact, doing an end-to-end anastomosis, with primary

union resulting. This man was seen at the Presbyterian Hospital two years ago, seven years after the operation, by Dr. Tilden Brown, and all that was found was a small tumor on one side of the rectum, which was causing some pain. Dr. Brown cut down upon it and found a fibroid condition, but no return of the carcinoma. So far as I know, this man has lived without any recurrence up to the present time, seven years. One device that I employed in that case which has been adopted in similar cases by Dr. Tuttle, the rectal specialist, consisted in holding the proximal end of the rectum by two strong sustaining sutures through the rectal mesentery and the tissues near the skin, for the purpose of holding the rectum fixed and taking the strain off the anastomosis stitches.

FOR HOW LONG TIME SHOULD WE ENJOIN REST IN BED IN CASES OF ABDOMINAL SECTION?

Dr. Francis Foerster.—My remarks are based upon a statement made by a member of this society while demonstrating a specimen in the April meeting. As this statement came to me, and I hope to most of those present as a revelation, I thought the subject to be a fit one for discussion. To the best of my recollection, the specific case was the following: Abdominal section had been performed for malignant disease of the ovaries. The left ovary, a solid tumor, larger than a man's head, was adherent to the gut and omentum, the right ovary was fully as large as a fist, the uterus had to be removed for obvious reasons. Malignant disease or conditions resulting from the operation had also necessitated a resection of the upper portion of the rectum and part of the colon to the extent of six inches. The demonstrator closed his remarks with the astonishing statement that the patient was out of bed on the sixth day.

Now, considering that such an extensive operation had been done, requiring certainly an incision from the pubes almost to the ensiform process, or else such a large tumor never could have been removed in toto, made me mistrust my hearing correctly. I therefore asked the operator for his reasons for allowing his patients, after such a severe operation, to get up as early as the sixth day. The answer was the following: "Because it has been my experience that they make better and quicker recoveries. I allow them to get out of bed as soon as they like, and to remain up as long as they want to. If there should follow an abdominal or stitch abscess, then, of course, they are returned to bed; otherwise they go about as they please a few hours after abdominal sections." In answering a question put by another person as to the suturing material he had used, he said catgut. As the gentleman is a man of extensive operative experience, and as he is also a teacher of our specialty in one of our institutions of learning, his remarks ought to carry some weight. I would like, therefore, to discuss them for general benefit, *sine ira et studio*.

Before entering upon the question, we will have to admit that in some cases we keep our patients longer in bed than absolutely

necessary to warrant a safe and uncomplicated recovery. This usage is to a great extent a relic of the preantiseptic and aseptic period, when wound complications were the usual outcome. We all know that the customary three weeks for uncomplicated cases can, if necessary, be cut down to two weeks of confinement in bed; but we also know that another week spent partly in bed, partly in moderate exercise, is of decided benefit to the patient. We hereby insure firmer union of the abdominal incision and restoration of the generally run-down constitution of the patient to or close to the normal. Nevertheless, we ought to welcome any endeavor of cutting loose from the habitual in operative treatment, provided the newly proposed steps are such as not to encroach upon the safety of the patient, and that they offer a decided improvement over past methods.

The only advantages of letting a patient get up sooner than customary after operations, and of the earlier discharge from the hospital, we find in the following: That hospitals would be less crowded, could accommodate a larger number of patients, and also that the patients, being mostly mothers, would return earlier to their home duties. These are the only points in my mind which can be raised, for I can never admit that patients, by leaving their beds at will after abdominal section, make a better and quicker recovery than those who had what I consider proper rest in bed.

While the first is an undisputed material advantage, we will find the second simply illusive, for the home surroundings are mostly such that the patients, not knowing the consequences, attempt or are required to do housework even at this early period of convalescence.

Have we any right to invite by such innovations postoperative accidents, endangering the lives of our patients, simply for the reason of materially benefiting ourselves or a hospital? The patient's welfare, surely, has to be considered under all circumstances first; our action and advice even to the poorest of the poor ought to be such as to show that we esteem human life as well as the trust put upon us. No consideration ought to be influential enough to dim our better knowledge, based upon ripened experience. Material interests cannot enter such a question. In the discussion several factors have to be considered, as there are: condition of patient, character of operation, length and locality of incision, method of suturing, material used for sutures, ligatures, etc. Besides, each case has features of its own which call for special consideration. It may be well to take up these factors singly.

Condition of patient and character of operation. To fall back upon the case cited, upon which these remarks are based, I will use it for illustration. Carcinomatous degeneration of the ovary, tumor having attained such enormous size, involving surrounding structures to such an extent as to necessitate a resection of a portion of the rectum and colon, must necessarily have considerably affected the constitution of the patient; if nothing more, the tumor has, by its large size, disturbed the equilibrium of all organs to

such an extent that prolonged rest in bed is absolutely indicated. Even women after normal full term delivery, we keep in bed at least nine days for good reasons; we claim that twelve days are even better, allowing the abdominal contents to readjust themselves to the suddenly changed conditions, besides improving the involution of the uterus and avoiding with some degree of certainty the possibility of thrombosis.

How much more does our patient, run down by malignant disease, having carried a tumor as large as a uterus at full term, require such rest, particularly when a hysterectomy besides the ablation of the tumor and a resection of the upper rectum have been performed. Operations on the rectum, especially extensive ones like resection, are most prone to thrombosis. In cases of resection of gut, when the end-to-end operation with catgut is performed, it is good surgery to keep the patient absolutely quiet for five or six days. Catgut is resorbed about the sixth day; we have to trust everything to the recently agglutinated surfaces when we attempt to move the bowels about the seventh day. Under such conditions bodily exertion is not to be thought of within two weeks after operation. I may be told the progress of the case shows best the correctness of the procedure. I deny this. I hope this case stands isolated, but even a few cases prove nothing more to me than that the operator was very fortunate in escaping the consequences of his utter disregard of fundamental rules which experience has so well established. In myomatous disease we know that the circulatory system is much impaired, that a prolonged rest in bed, even longer than three weeks, is often of positive benefit, while an early interruption of bed rest is liable to invite serious consequences. The removal of a pyosalpinx, with its manifold adhesions, requiring in some cases a protective application of gauze for purposes of drainage, as well as to control oozing surface bleeding, constitutes an operation which in its after treatment ought to be handled with circumspection. But even in cases requiring ordinary salpingo-oophorectomy, where patients must have been sufferers for some time, or else they should not be advised to undergo an operation, the general constitution needs building up. A reasonable time of rest in bed is therein a valuable adjuvant.

Length and locality of incision are important factors in the question. Gynecologists usually select the median line, or else—and this is my preference—they go through one or the other of the rectus muscles in making the incision. The length of the cut varies from two to ten inches, according to the size of the tumor or the difficulties of the special case. In clean cases, the smaller the incision the better and firmer the resulting union. The larger the incision, the more fear we must have for the occurrence of weak points or subsequent stretching of the scar, resulting in a more or less troublesome hernia. A prolonged rest in bed—I am almost temped to say in proportion to the size of the incision—is of absolute necessity to diminish the chances of such an accident.

Naturally, the method of suturing has to be taken into consideration. I would expect in the quoted case a rest in bed of at least 16 to 18 days. The method of suturing and the material used are of the greatest importance in our question. The through-and-through suture, the layer suture, and the combined through and layer suture come under consideration. I personally began some twenty years ago with the through-and-through suture, using in turn all the material recommended: silver, silk and silkworm gut. After a while I practised layer suturing with catgut and through suture of silk or silk-worm gut. For good reasons I dropped this method; for many years I used silkworm gut as a through-and-through suture with satisfactory results. During all these years I have had only one misfortune. While using wire sutures, two of the sutures broke on the second day, during an attack of vomiting, allowing a loop of intestines to protrude. Unfortunately, the accident was not discovered until it was too late. Of such misfortunes occurring with others, many cases are known to me, but it is not my privilege to report other operators' mishaps; some of them are matters of record. In general I can say some such accidents happen early, and others as late as two weeks after operation. The method employed was mostly layer suturing, when catgut was used and through sutures were omitted. Aseptic wounds have parted with the exertion of a coughing fit several days after operation, not to speak of unclean wounds, especially those soiled by carcinomatous material, which I have known to reopen two weeks after operation.

To return to the case under discussion, we have here these very conditions. A certain amount of serosanguineous fluid must have been present, as we usually find in these carcinomatous cases, especially when the tumor has attained such a size. The operation cannot be conducted without infecting the surface of the long incision, partly or totally. Besides, catgut was used for suturing material; we presume layer suturing was done. All these factors are inviting disaster. Nevertheless, the patient was out of bed on the sixth day and made a good recovery. Was she not lucky?

The impetus to shorten the period of rest in bed in cases of abdominal section, I know, has been lately given by different sides, but only for suitable cases. Years ago such a move was advocated by some. The improvement in operative results, especially the primary union of the abdominal incision, has made them bold. One case from that period is generally known. A patient's wound opened and prolapse of the intestines followed while she was in a carriage on her way home from the hospital. I personally did my best to try to shorten the time in hospital by removing the sutures on the sixth or seventh day, and I think I have done my share of harm in this way. For years I have not removed the stitches before the tenth or twelfth day, and I am certain that the additional period of six days has assisted me materially in getting much better results as to permanent union of the wound.

In conclusion I would say that the case quoted cannot be looked

upon in any other light than a hazardous experiment. It is a question in my mind whether our position of trust gives us the right to expose human life to obvious dangers for such imaginary benefits as are held out to us. I am sure that if we advised our patients as to the possible dangers they might encounter through such an innovation they would surely protest. The statement of the gentleman: "The patients go about within a few hours after abdominal section," I do not touch upon, for this, surely, must have been a lapsus linguæ.

Dr. Hermann J. Boldt.—Dr. Foerster's remarks are interesting from a theoretical standpoint, but are nothing but theory. I repeat again, "eating of the pudding proves its quality." One or two years ago, when my attention was called to this method practiced by Dr. Riess, of Chicago, by one of the matriculants at the postgraduate school, I could hardly believe the correctness of the statement, and I wrote to Dr. Riess to inquire whether he allowed his patients to get out of bed within three days after abdominal section. The letter I received from him read about as follows: "The statement made to you is correct, with one exception; instead of being up and out of bed on the third day, they get up within a few hours after operation on the same day, and are encouraged to move about." Since then I have had not one, but a large number upon whom I have practiced that method of allowing them out of bed as soon as I could induce them to do so without restraint. They are allowed a full diet as soon as they feel like having it, sit up in bed, or get out of bed, as they choose. Dr. Foerster's remarks are entirely erroneous, because he admits having had no experience with this line of treatment. I have had such an experience and can corroborate all that Dr. Riess has stated. Those patients who are compelled to remain in bed on their backs for weeks do not do so well; but if they are allowed to get about without any restraint they sooner regain their strength. By the time two weeks have passed they can be about and resume their household duties. In not one of my cases has the wound given way. Dr. Riess wrote that in not one instance had hernia resulted; neither have I had a case of hernia, so far as I know, following this procedure. I allow these patients to do as they please unless there is some absolute contraindication, such as suppuration of the abdominal wall. In a number of instances I have had patients leave the hospital from one week to eight days after abdominal section for removal of abdominal tumors. Dr. Foerster's remarks are entirely theoretical.

Dr. H. C. Taylor.—Do you use adhesive plaster?

Dr. Boldt.—Yes, over the plain gauze. After one week I remove the larger portion of the gauze. Only a small portion of gauze is placed over the wound, and then straps of adhesive plaster are applied. It goes then around the whole body.

Dr. H. C. Taylor.—You then rely more on the adhesive plaster to support the wound than you do upon the sutures?

Dr. Boldt.—Not necessarily. So far I have had absolutely no

trouble with this method. The patients are allowed to go about and they regain their vigor more quicly than by the older method of allowing them to remain in bed.

Dr. G. G. Ward, Jr.—Does the length of the incision influence you in any way in deciding upon this method?

Dr. Boldt.—Not at all.

Dr. H. N. Vineberg.—There is one point in regard to the treatment of the wound with adhesive straps that I would like to mention. In my experience the patients complain more of the adhesive straps than any other thing after the first two or three days. Therefore, I try to take them off as early as possible. In two or three instances where I have taken them off too soon I have regretted it, because of the separation of the wound on account of lack of support. As a result, I now never allow the adhesive straps to be removed before the tenth of twelfth day after the operation.

In regard to closing the abdominal wound with sutures, I use catgut for the peritoneum, chromicized catgut for the fascia and muscles, and silk for the skin, passing them through far out. It seems to me that this is not so important as the consideration of what is taking place within the pelvis after these severe operations. If there are diseased adnexa with adhesions, one must leave a large and raw surface, and this surface is going to heal only through the presence of a certain amount of exudate. The question naturally arises, "Will the healing process be benefited more by rest than by getting about?" We have had experience with the rest method, and perhaps we may gain something after having had experience with the other and newer method. I must say, however, judging from experience, that it would be extremely hazardous to allow a patient to get up six or seven days after a severe abdominal operation. With regard to what Dr. Foerster said concerning uterine fibroids, it should be borne in mind that one must ligate a number of veins and that thrombosis will occur in them; therefore, if we allow such patients to get up out of bed so soon, is there not danger of embolism? These cases should be kept in bed five or six weeks. With regard to taking our simple cysts, where there are no adhesions and a small pedicle, there is no more danger than there is in taking out an appendix, and I do not believe, in such a case, that harm would follow from letting the patient up, judging a priori, within six or seven days. Ordinarily I find that patients who have been subjected to a severe abdominal operation are in no condition physically to be out of bed at the end of six or seven days. It takes them, as a rule, that long before they have recovered from the effects of the operation, *i.e.* before all the distressing symptoms following such an operation have disappeared.

Dr. H. C. Coe.—Dr. Foerster's conclusions are so self-evident that I am surprised to find that they are questioned. There is another viewpoint from which this subject should be considered, and that is the medicolegal. Suppose you have a patient that on the fifth or sixth day after operation is allowed to get out of bed, and then dies of embolism; there is no man in this city who would

support you, and it would go hard with you. Even after the simplest aseptic laparotomies we have late complications. Thrombophlebitis may follow the easiest section; in fact, I had a sort of epidemic of afebrile phlebitis lately, one case the second week after a simple ovariotomy and the other, after an interval, an appendicitis case. The patients were allowed to leave their beds during the second week after the operation, and a phlebitis followed. Suppose that a suit was instituted, what defense could one offer? Certainly the theory of septic infection would be an unpleasant one in every instance. It is true that Dr. Boldt has had experience, and that counts for much, but I can hardly say that I am in accord with him. I do not mean to say that we may not adopt this method, but I do say we must consider the responsibility placed upon us as long as a patient remains under our care.

Dr. Le Roy Broun.—I should like to hear more from the other members of this society regarding this method before I adopt it. There is unquestionably a great deal of nervous disturbance after every abdominal operation, and that without doubt is best treated in bed. At the end of one week the patient is not in fit physical condition, aside from the histological condition of the wound, to get out of bed. I would not care to adopt this method until I know something more about the results.

Dr. J. M. Mabbott.—From a theoretical standpoint an objection to leaving the patient in bed so long after an operation is that the patient's general health does not improve; without exercise, massage or electricity, these patients lose strength after three, four or five days. This was recognized by Dr. S. Weir Mitchell, and, therefore, he employed overfeeding, electricity and massage, the last two each given one hour daily, to take the place of exercise. I think that Dr. Boldt is right in stating that there is only a theoretical objection to the method advocated; patients will not improve during the entire period of a week or two after operation when kept in bed, and patients previously in good condition are liable to get into a state of physical exhaustion, that is, below a certain percentage of normal health. This is particularly true of obstetrical cases. I do not know what proportion of women could get up on the third, fourth or sixth day, so far as their general health is concerned, but I do know that on the third, fourth or sixth day they ask, "How soon will you allow me to get out of bed?" The uterus weighs one and a half pounds and must undergo involution, and, therefore, one should not allow them out of bed too soon. I know of one patient who got up too soon after confinement, and when asked how she was about three months later, exclaimed: "My womb is completely outside my body." In obstetrical cases the uterus should be supported by the involuted ligaments. But this does not hold true in gynecological practice. I think that it is only fair that a certain number of men who have reputations should make a trial of this method, which will save so much time, provided the health of the patient is not injured by so doing. Two questions naturally must be considered: (1) Is there

primary union? and (2) Can one give a certain amount of support and prevent undue distention of the abdomen when the patients are out of bed? I once saw a patient on the sixth day after an operation for appendicitis, and he asked me if I wished to see the wound. To my surprise he drew in his abdomen and I could see the wound. Fortunately, it was perfectly healed. In this instance the dressing had never been removed, and yet by this drawing in of the abdomen I was enabled to see the wound. The question arises, "Is the wound not equally supported by a given dressing when out of bed?" If the patient coughs he certainly would be better protected.

Dr. Hermann J. Boldt.—How many patients would care to get up of their own accord I cannot say. So far no mishap has occurred. If one carefully sutures the wound, approximating its edges properly, I cannot see how any trouble will happen from allowing the patient out of bed on the third day. Dr. Riess has been strongly antagonized in Chicago for doing this, but neither his nor my experience has caused us to change our minds regarding the value of his method. If it should happen that the wound was in bad condition, that patient, of course, would be returned to bed.

Two or three months ago I had a woman with an umbilical hernia; she was very stout and suffered a great deal from dyspnea. I operated upon her one morning, and she was out of bed that same night, sitting up in a chair. At the end of a week or ten days it was thought best to return her to bed, and then I did not allow her to get up as before. I believe it is thought that it is detrimental to allow a patient to be on her back for two weeks; they cannot recover their muscular tone or energy so well. Not only do I advise allowing patients out of bed so early, but, furthermore, I have them exercise in bed so soon as their physical condition will admit of it. In this way I aid them in getting back their muscular energy. I have had nothing but the most excellent results.

Dr. H. N. Vineberg—Do you examine all cases to see whether exudate has formed?

Dr. Boldt—Yes.

Dr. Vineberg—What proportion of the cases have it?

Dr. Boldt—I cannot say, but it is very seldom present.

Dr. Francis Foerster—Dr. Coe has brought forth a point of greatest importance, which I should not have omitted in the discussion of the question. I would like to ask Dr. Boldt whether he treats his private patients in the same way as the hospital poor cases? There is a point in Dr. Boldt's statement to which I wish to call attention. He speaks of stitch abscesses as if they occurred frequently with him; this may be a consequence of his procedure. Within the last year I have seen but one abscess, and this from a fresh sample of catgut, which was used for ligation of a wound in the abdominal wall. This abscess was noticed as late as the eighteenth day. If that patient had been allowed to go home

early, *i.e.* a few days after operation, just think of the disagreeable condition she would have been in. As Dr. Waldo has stated, I have also seen hematoma sometimes follow exertion even with patients in bed. They may break down and form abscesses. I imagine such hematomata and abscesses occur often when patients are treated according to Dr. Boldt's method. Rest in bed will do these patients good. Let us take such a case as the one upon which I based my remarks, a patient in miserable condition, who required a resection for extensive carcinomatous degeneration of gut, as well as a hysterectomy, besides the removal of large ovarian tumors, such a patient necessarily must be much run down; rest in bed would surely have benefited her. We should all be in favor of progress, and I am glad that Dr. Boldt also stands therein a champion; what he has shown may give us an impetus; personally, I am too timid to follow the method advocated, but we should advance slowly and never forget that we deal with human beings.

TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

Meeting of April 7, 1905.

The President, J. W. Bovée, M.D., *in the Chair.*

Dr. Acker read the essay of the evening, "The Diagnosis and Treatment of Pneumonia in Children."*

Dr. Adams fully concurred with the essayist, especially in what he had said in regard to fresh air and no medicine. He had been impressed with the frequency of croupous pneumonia to-day, as compared with twenty years ago. This opinion was in accord with those previously expressed by Drs. Busey and W. W. Johnston of this city. Since 1887 the number of cases had apparently increased. He attributed it to the better ability to diagnose the condition. There was no disease in which the diagnosis could be more readily made, even without physical signs. It could be made by seeing the respiratory movements. In central pneumonia the physical signs were not easily made out. In bronchopneumonia a history of illness antedated the onset of the pneumonia. One of the speaker's cases had an ear complication after pneumonia. He asked whether the pneumococcus was responsible. He thought the influenza bacillus was the cause, and that there was a direct relation between the influenza bacillus and pneumonia. He did not use poultices and silk jackets. The results of fresh air and open air treatment were very good.

Dr. T. C. Smith said that he used oil-silk jackets. He did not

*See original article, page 503.

believe in abandoning this mode of treatment unless for some good reason. He believed in external applications.

Dr. Sprigg said that he used oil-silk jackets, as they added to the comfort of the patient, kept the patient warm, and the chest relaxed, and promoted capillary relaxation.

Dr. Deale stated that he also used oil-silk jackets and knew no reason why they should be given up. Children who were accustomed to sleep in fresh air and had fever could not catch cold, but after the fever was over they might do so.

Dr. Loren Johnson emphasized the necessity for fresh air as these cases die for want of oxygen. It was important in increasing the appetite and well-being of the patient. One should avoid placing the patient in a draught. A fan could be used to keep the air in the room fresh. Cold air stimulates, but there was no advantage in bitter cold air.

Dr. Lewis said that it seemed to him that the same line of treatment was applicable in all forms of pneumonia. He recalled very distinctly the statement made by Dr. Walsh, this winter, that when the heart was all right the patients did not die. If remedies like applications of poultices and the oil-silk jackets did no harm, why should they not be used? There were two reasons for favoring fresh air: First, to give oxygen, and, second, to get rid of noxious vapors. In a few cases in which he had used oxygen early he had had good results.

Dr. Cooke also favored fresh air, however cold, in the treatment of pneumonia, though draughts should be avoided. Oxygen produced irritation of the lungs. Nature had given the best mixture of oxygen and nitrogen.

Dr. Adams prevented direct draughts by use of a screen. He believed oxygen, as usually administered, was useless. If given at all, it should be used early. The good results reported by Dr. Acker were probably due to the use of fresh air. Oil-silk retained the secretions and kept the chest bathed with them.

Dr. Smith said that the number of cases reported by the essayist was too small to draw conclusions from. The oil-silk jackets tended to relieve the congestion of the internal organs, this being shown by the moist skin beneath the jacket.

Dr. Acker stated in closing that many cases of the disease were due to the grippe. The influenza bacillus probably predisposed to the invasion of the pneumococcus. The treatment depended upon the nature of the process, bronchopneumonia requiring more treatment than the croupous variety, especially stimulation. Most cases felt better in the fresh air, and some of his cases cried for it. He had discarded the oil-silk jacket. External applications probably did no good. In two instances he had observed blisters, which were produced by the use of a clay preparation. He said that the mortality of the disease had increased, and asked if it were due to influenza complications or to heart lesions. Most of the cases reported in his paper were not due to the grippe. He had never

seen oxygen do any good except in one case of pneumonia complicating whooping-cough.

Meeting of April 22, 1905.

The President, J. W. Bovée, M.D., *in the Chair.*

Dr. Kelley presented a case of Abdominal Pregnancy.

Mrs. B., colored, aged 35, married. Menstruated first at 14; regular except during pregnancy. One child four years ago, one miscarriage. Last regular menstruation June 1, 1904, During the second and third months patient had irregular discharges of blood from the uterus, with some pain, and thought she might miscarry again. After the end of the third month, the pregnancy went on normally until the end of the eighth, when having eaten heartily of cabbage she was taken suddenly with severe abdominal pains. Until this time the fetal movements were normal. Her physician saw her and shortly relieved the pains. She was up the next day, but the abdomen was somewhat sore. At the end of the ninth month her physician found the abdomen smaller and could detect no fetal movements, though the patient said they were present. He saw her at frequent intervals, and observed that the abdomen grew constantly smaller. He found a divided mass occupying the abdomen, the larger portion on the right side. When seen by the speaker, on March 30, there were a tumor reaching two inches above the umbilicus on the right, and what seemed to be another in the left pelvis, much smaller. The uterus was somewhat enlarged and occupied a position between the two tumors. A diagnosis of ectopic gestation was made and the patient was sent to the Columbia Hospital, where she was operated on the next morning. On opening the abdomen a tumor was exposed covered with adherent omentum and intestines. These having been released, the tumor was found to be attached to the right broad ligament. The tumor was ruptured on the left and the hips of a fetus protruded. The pedicle contained large vessels, looking like intestines, but the hemorrhage was easily controlled. The head and limbs of the fetus were still in the sac. All the liquor amnii had been absorbed, which accounted for the decrease in size. The patient made an uninterrupted recovery.

Dr. Jones asked whether the age of the fetus could be told by the nails, length, etc.

Dr. Stone said it was hard to get a history from these cases. The rupture of the sac and the escape of blood, etc., into the peritoneal cavity caused pain. Dysmenorrhea was, at times, caused by the escape of blood through the tubes into the peritoneal cavity. The sac which surrounded the fetus was probably made up partly from the membranes which escaped at the time of rupture of the tube.

Dr. Lewis asked if the ovary on the side of the pregnancy was found.

Dr. Kelley replied that the ovary had been found. No measurements of the fetus had been taken. In making his diagnosis of tubal pregnancy previous to operation, he concluded that the sac had ruptured, but what he took for blood clot proved to be part of the fetus. The uterus was two and a half times normal size.

Dr. Kelley presented a Kidney Which Had Undergone Almost Complete Fatty Degeneration.

Mr. C., white, aged 44 years, suffered as a schoolboy with pain in the right side, which an old physician said was due to stone in the kidney. Ten years ago he suffered so severely that he went to a hospital in Columbus, Ohio, where a diagnosis of gallstones was made and an operation was attempted. Finding the tumor was a kidney, the operation was abandoned. Six months later he entered another hospital, and an incision was made in the loin, and, as the kidney was found to be much larger than was diagnosed, the operation was again abandoned. The diagnosis at this time was tubercular kidney. He recovered from the operation with two fistulas in the back, which constantly discharged. He came under the observation of Dr. Chadwick of this city about four years ago, who called the speaker to see him. The patient was a well-developed man, in fair flesh. The right kidney could be seen bulging up the anterior abdominal wall. There were two fistulas in the back, one near the spine and the other about six inches to the right of and the same distance below the other. Both were discharging a large quantity of pus, but no urine. The urine showed little albumen and large amount of pus. Dr. Chadwick had examined his urine at intervals during the past four years and had found practically no change. No tubercle bacilli were ever found, and the urine presented no special evidence of stone. Operation was advised and refused. About four months ago the patient began to lose weight rapidly, and six weeks ago became practically bedridden and desired an operation. He was now suffering very much with vesical tenesmus, which had been present only occasionally before. At the Sibley Hospital an incision was made into the abdomen through the old scar, where there was a hernia resulting from severe coughing. The left kidney was found about six inches lower than normal. The liver and spleen were enlarged, probably on account of the prolonged suppuration. The abdominal wound was closed, and an incision was made from the lowest rib, one inch from the spine, following the rib and down to an inch internal to the anterior superior spine of the ilium. The peritoneum was stripped from the kidney, which was pushed very low by the enlarged liver, and the kidney stripped from its capsule. The adhesions were many and had to be cut frequently with scissors. The vessels were clamped, the kidney was cut off, and the pedicle sewed with catgut. A wound in the peritoneum was also closed with catgut. The wound in the loin was drained with a tube and gauze. The kidney was found to contain several large stones, and had undergone fatty degeneration, so that there was only about a dram of kidney tissue left. The patient reacted

well from the operation. During the first thirty-six hours he excreted 36 ounces of urine. During the remaining four days of his life he did not excrete a drop and died of uremia on the fifth day.

Dr. Carr asked whether the other kidney was normal.

Dr. Kelley replied that it was larger than normal and was situated just above the brim of the pelvis.

Dr. Carr said that the normal position of the kidney was with its lower border just at the brim of the pelvis. He had heard of several cases where one kidney was operated upon and the operation was followed by suppression of urine. It was most important to know the condition of both kidneys. He believed that after suppression of urine had occurred the infusion of salt solution would do no good.

Dr. Stone said that the most important fact was that the remaining kidney did not functionate. Was it due to nephritis? It was very important to know the proper treatment for suppression. In one of his cases, where a vaginal operation was done, suppression of urine occurred for seven days after operation upon a patient who was in fairly good health previous to operation.

Dr. Lewis asked what the members of the Society would have done in a similar case if they had discovered the other kidney to be diseased before operation.

Dr. Bovée called attention to the value of cryoscopy of the separated urines in determining the functional ability of the kidneys.

Dr. Carr would probably have done the same as did Dr. Kelley. He would probably use a local instead of a general anesthetic in operating upon such a case.

Dr. Moran said that the amount of urea in the absence of clinical manifestations, was not of much significance except as an index of tissue metabolism. The statement usually seen that in pregnancy the output of urea is larger than at other times was probably not true, as shown by a large number of examinations at the Columbia Hospital.

Dr. Miller said that acute nephritis after operation was quite rare in kidneys which were previously healthy. In diseased kidney an acute exacerbation of the old disease might follow an operation. In a few cases he has seen suppression of urine following ileus occurring in the small intestine.

Dr. Carr presented a Fibroid Uterus Showing the Effects of Oophorectomy.

The patient was about 45 years old. The ovaries had been removed about one year before for bleeding fibroid. She had such a bad heart that at that time hysterectomy was deemed unjustifiable. One year later the uterus, which had been as a large as a child's head, was diminished so that a vaginal hysterectomy was done successfully.

Dr. Stone asked whether the uterine vessels had been ligated at the first operation.

Dr. Carr replied that they had not.

Dr. Miller said that he had assisted Dr. Carr at both operations and could testify to the marked decrease in the size of the uterus at the second operation. When the oophorectomy was performed a hysterectomy would probably have been fatal, considering the condition of the patient's heart and the size and situation of the tumors. The last operation was not especially difficult.

Dr. White read the essay of the evening.

THE RELATION OF CONCEPTION AND BIRTH TO SEASON AND HOUR.*

Dr. Kelley said that in his four years of hospital life he also had come to the conclusion that season had no influence on conception. Statistics obtained from hospital records on these points were not quite fair, as the wards frequently were full and some cases could not be admitted. As regards hour, he had made no study except as to the night and day. Most cases probably occurred in the day. Night makes a greater impression. As regards the month in which we would expect conception to take place, he would say that man had been so long civilized that primitive influences played little part, and, therefore, we were not surprised that there was little difference as to the month. Conception probably took place most frequently just after menstruation, but there was no fixed rule.

Dr. Carr was of the opinion that most of his cases came in the day.

Dr. Adams said that Table III. showed just what we would expect from our knowledge of fashions and customs. Religious customs, etc., would affect marriage, and hence conception, but only in primiparæ.

Dr. Cook said we were accustomed to regard the menses as having a bearing on conception. With animals, rutting occurred in this climate in the spring, but this was not apparent in man to any marked extent.

Meeting of May 5, 1905.

Dr. D. W. Prentiss read the essay of the evening,

THE ANATOMY OF A CASE OF TUBAL PREGNANCY,†

and presented the specimen.

Dr. Johnson said that the presence of the decidua, which is cast off in the form of shreds with hemorrhage, taken in conjunction with the bimanual examination, would lead to the correct diagnosis of extrauterine pregnancy. Tubal pregnancy usually occurred in the ampulla and in many cases led to tubal abortion. When this was not complete and the placenta remained attached, it gave rise to an occasional case of what is known as abdominal pregnancy.

Dr. Miller said that he believed that most cases of so-called abdominal pregnancies were originally tubal in origin. The placenta remained attached to the tube and the sac was partly extended, and as the fetus developed it extended in the abdominal

* See original article, page 507.

† See original article, page 549.

cavity, becoming attached to the various structures by adhesions.

Dr. Bovée said that there was no instance of a true abdominal pregnancy on record.

Meeting of May 19, 1905.

The President, J. W. Bovée, M.D., *in the Chair.*

Dr. Miller reported A Case of Unusual Adhesions of a Fibroid Tumor.

L. D., colored, laundress, aged 34 years, was referred to me by Dr. Dixon. She complained of painful and profuse menstruation, the flow having been of the character of profuse hemorrhages for the past two years. She had suffered with severe pain in the lower abdomen and back for one year. She had had two miscarriages, Diagnosis: fibromyomata of the uterus. Examination of chest, showed an irregular, firm mass occupying the pelvis and extending slightly above the umbilicus, taking the position of the uterus. Diagnosis: fibromyomata of the uterus. Examination of chest, urine, etc., negative. Operation, May 11, 1905. The uterus with its tumor, the right tube and ovary, and the vermiform appendix were removed. On opening the abdomen just to right of the median line, a cord the size of a lead pencil was noticed slightly to the left of the incision, extending from the umbilicus into the pelvis, just above the bladder. Accompanying this cord, and to its left, was a vein which appeared to be about twice the size of the cord. The cord was incised and appeared to have no lumen. The vein continued its course from 3 cm. above the umbilicus to a point where the tumor was densely adherent to the abdominal wall over an area of 2 by 4 cm. On examining the tumor mass closely it was seen to be pedunculated, with a twist of the pedicle. The vein was evidently part of the collateral blood supply of the tumor brought about by an inflammatory process due to the tension of the pedicle and a consequent adhesion to the abdominal wall. The vermiform appendix was adherent to the right of and behind the cecum and ascending colon, its tip being adherent at about the lower costal border behind. Its situation was so high that the appendix could with difficulty be removed through an incision extending above the umbilicus. The appendix was amputated at its base and then separated from its adhesions above.

Dr. Balloch said it was unusual to find the adhesions at one point of the abdominal wall.

Dr. Carr suggested that the adhesions were due to the torsion which brought about an inflammatory condition of the tumor and the formation of the adhesions.

Dr. Stone reported a case of Torsion of the Mesentery (volvulus) with Intestinal Obstruction.

Mrs. D., white, age over 40, was ill one week with symptoms of colic and constipation before my visit in consultation with her physician, on May 3. During the past few years her health had

from time to time been poor, and she had been under the care of at least two surgeons, one of whom, the reporter, performed panhysterectomy in 1902, for suspected carcinoma uteri. She made an excellent recovery from this operation, without any indication of infection. When seen by the writer she was under the influence of morphia and without abdominal distention. During the present illness all of her pain had been located in the epigastrium and the relief given by morphia made us think her case one of gallstone colic. However, on May 5, we were again called and found all of the symptoms of intestinal obstruction. She was brought to the hospital that night and, owing to the lateness of the hour, we decided to wait until morning to operate. When the abdomen was opened, we found nothing in the upper abdomen to explain the pain. The omentum was adherent to the line of incision made at the previous operation. On the left side were a few adhesions of omentum in the region of the infundibuloovarian ligament. Under this, but not associated with it, was a firm cord which proved to be the mesentery which supplied the lower portion of the ileum. About 30 inches of the ileum was collapsed, although much more of the bowel was involved in the twist. Adhesions of "kinked" bowel were found as usual and separated. The lower portion of the distended bowel (ileum) was attached to the ascending colon, thus affording an additional opportunity for escape of feces and gas. A small Murphy button was used for this purpose. Bowel opened in two places to discharge contents for relief of distention. The patient responded to stimulation and recovered.

Dr. Miller asked if the mesenteric vessels were thrombosed, if suppression of urine had occurred, and if it were a rational procedure to make the anastomosis described by Dr. Stone. If the bowel were necrotic, why do the anastomosis at all?

Dr. Stone answered that his experience had been that the diseased bowel was put out of use temporarily and that the procedure which he used was life saving. The diminution of the amount of urine was not marked.

Dr. Abbe said that side tracking of the bowel seemed to him very desirable. By putting the part at rest it was allowed to recover.

Dr. Carr said that he did not believe that the paralysis of a small portion of the small intestine would prevent fecal matter from passing. The peristaltic movement of the small intestines would push the contents along. It did not involve any physiological work on the part of the diseased portion. He did not like the idea of this method of anastomosis. One had better bring the intestines out of the abdomen, open externally and subsequently do the anastomosis. Patients with obstruction did not stand a resection well.

Dr. Stone said that the patient would not have stood a prolonged operation and he wished to avoid an artificial anus.

Dr. Carr read the essay of the evening,

CHRONIC INTERSTITIAL MASTITIS.*

Dr. Balloch said that his ideas on the subject were much in accord with those of the essayist. He believed that the first changes were in the ducts. The epithelium broke down and formed cysts. Traumatism had little to do with the etiology because the condition was usually found in both breasts. It was found more often in younger than in older women. Most of his cases were in young married women, who were sterile. Whether uterine conditions had any influence, he was not in a position to say. The treatment should be the removal of the disease. He did not believe in temporizing when the woman discovered a lump in her breast. She would be unhappy until it was removed, and if the surgeon refused, the quack would take it out with his salves. One could remove the nodules under cocaine anesthesia. He removed the larger ones first, and if the others developed they could be removed later. The condition was frequently the beginning of an adenocarcinoma. He believed that many, if not all, cases of adenocarcinoma of the breast began in this way. We should carefully watch such cases and remove the breast promptly if carcinoma developed. When ulceration occurred, cancer was already present.

Dr. Van Rensselear stated his belief that in the later years of life the breasts undergo a fibrous change, hence he was surprised to hear the essayist say that they occurred in young women.

Dr. Moran said that towards the menopause both the parenchyma and fibrous tissue atrophied. His clinical experience had been in accord with that of essayist. A case of his was a sterile married woman at about the menopause. One breast was involved and was removed, but in a few years the other also required removal. He thought the whole breast should be amputated in operating for the disease.

Dr. White thought that statistics as regards race, etc., would be interesting. He believed it occurred most often in whites.

Dr. Van Rensselear said that the retention cysts which occurred in early life were very different from chronic mastitis where the whole breast was involved.

Dr. Bovée had been impressed with the genital features in the cases he had seen.

Dr. Carr said that no doubt the disease occurred at all ages. He had seen it in a girl of 14 years where the disease was extensive; had seen it anywhere between the ages of 14 and 60 years. All but four of his cases occurred under the age of 30. It also occurred in old women. In a woman 30 years of age or more, cysts should be excised, and when at all advanced the whole breast should be removed. In young girls it was very puzling to know the best treatment, as it was a serious matter with them to remove the whole breast. He could not understand how proliferation of

* See original article, page 553.

the epithelium would form a cyst unless some inflammatory lesion should obstruct the ducts by causing an increase of fibrous tissue. He had never seen a case in the negro race.

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF LONDON.

Meeting of May 3, 1905.

The President, W. R. Dakin, M.D., F.R.C.P., *in the Chair.*

Dr. Robert Boxall read a paper on Mortality in Childbed Both in Hospital and in General Practice.

In this communication the records of the New York Road Hosptial and the returns of the Registrars-General for London, England, and Wales, Scotland and Ireland are presented in such a form that they may be strictly comparable.

The difference between the mortality of childbirth and mortality in childbed is pointed out.

The diseases included under the respective headings of puerperal sepsis and of accidents of childhood are numerated.

The hospital statistics are first dealt with. The death-rate is estimated in terms of the number of deliveries.

In separate tables are given the mortality in childbed for three periods: 1833—1860, 1861—1877, and 1879—1904, and also the death-rate for the last twenty-five years, under separate headings for puerperal sepsis, accidents of childbirth, and accidental diseases.

A separate record of each fetal case is given in an appendix, differentiating also those cases sent into hospital on account of the serious nature of the confinement.

The deaths and death-rate from puerperal septic disease during the last twenty-five years is further considered in relation to the particular antiseptic used in the hospital at the time.

The following facts are worthy of note:

(1) The almost complete absence of serious septic illness during the sublimate periods.

(2) The recurrence of serious septic illness during the experimental use for a short time of salufer for douching purposes only.

(3) The complete absence, on the one hand, of severe septic illness during the last sixteen years among the 8,000 odd patients who were attended throughout in hospital.

(4) The significant occurrence, on the other hand, of four cases of fatal sepsis in which ineffectual attempts at delivery had been made outside before admission, and—

(5) The complete failure, when thus introduced, of septic illness to spread and infect other patients.

The various hygienic measures from time to time adopted with a view to improve the condition of the hospital are touched upon,

under the heads of ventilation, drainage, and cubic space per patient, in addition to the use of antiseptics and disinfectants.

It is pointed out that, while strictly maintaining the general principles of disinfection, and of endeavoring to maintain in the hospital a condition of rigid asepsis by regarding every attendant —nurse, midwife, or doctor—as a potential purveyor of infection, and by regarding every patient on admission as possibly having in and about the lower parturient passages pathogenic organisms, it has been found possible to abrogate many of the details at one time insisted upon without impairing the inefficiency of the methods adopted. For instance, while retaining the douche before delivery and immediately afterwards, routine douching during the greater part of the puerperium has been given up—the douche is now used once only, on the fifth day; both the labor and lying-in wards have been fumigated less frequently, and formalin substituted for sulphur; the washing of the walls and furniture with carbolic lotions has been discontinued altogether; and more patients are now put to bed in the same ward-space than formerly.

Comment is made on the disastrous results attending the attempt to replace sublimate by salufer for douching. The danger attending the use of many of the much advertised but little proved antiseptic agents is pointed out.

Reference is made to the fallacy of regarding as impracticable the prevention of puerperal sepsis in private practice, either on the ground of the impossibility of preventing infection from without, or because infection poison may be already stowed away before labor commences in an inaccessible position inside the patient where it cannot be destroyed.

Tables also are given side by side, for purposes of comparison, the mortality of childbirth and in childbed at the York Road Hospital for the last twenty-five years, and in England and Wales for the years 1901—1903.

In spite of the large number of serious cases sent to hospital, the balance shows in favor of the hospital on every count with the exception of intercurrent disease. Deaths occurring under the head of accidents of childbirth are less, and from septic disease the deaths are very markedly less in hospital than in private practice. The mortality of childbirth in the hospital during the last twenty-five years stands in relation to the mortality of childbirth in England and Wales for the last three years for which figures are available as three to four. It may be remarked further that if the last sixteen years only were taken into account, the difference in favor of the hospital would be still more marked, for, as already stated, during that time only four cases of fatal septic disease have occurred, and these four cases have all been introduced from without.

Finally, a series of tables and charts are presented in order to show the variation in the mortality of childbirth from year to year in London, and in England and Wales, in Scotland and in Ireland. The figures go as far back as the returns given in the reports of

the Registrars-General. The death-rates have been estimated according to the number of registered births, which, for all practical purposes, may be reckoned as the number of confinements.

The following conclusions are offered:

(1) The total death-rate from childbirth has not diminished either in England and Wales, in Scotland or in Ireland, where it is abnormally high as compared with the other divisions of the kingdom, but in London it has declined considerably.

(2) The death-rate from accidents of childbirth has declined slightly in each division of the kingdom, but is abnormally high in Ireland, and in London has markedly diminished.

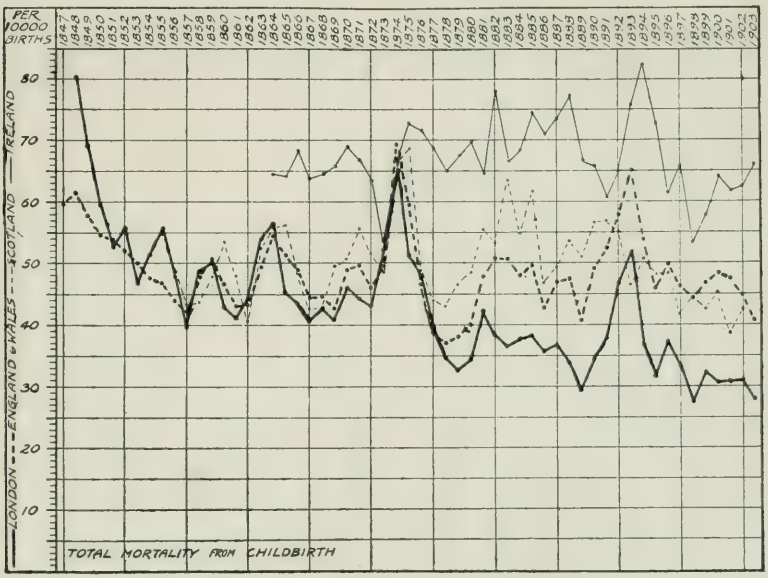


CHART V.—Childbirth Death-rate in London, England and Wales, Scotland and Ireland.

(3) The death-rate from puerperal septic diseases has, if anything, shown a tendency to increase in each division of the kingdom, but in London has been declining for at least the last decade.

DR. GALABIN expressed an opinion on the conclusion that the death-rate from puerperal sepsis has, if anything, shown a tendency to increase in each division of the kingdom. He thought this conclusion too pessimistic and not supported by the charts. From statistics which he had himself published, he concluded that there had been a distinct improvement in the mortality from puerperal septicemia in England and Wales since 1880, which for the previous twenty-five years had been conspicuously absent, although it was not so great as might be desired, being rather less than half the improvement in septic diseases apart from the puerperium.

Dr. W. S. A. Griffith said that it was obvious to every consultant that as a rule the disease was neither diagnosed nor was efficient treatment adopted until the patient was hopelessly septic and beyond the aid of successful treatment. He thought that some other cause must have been at work to account for the disastrous effects of douching with salufer. At Queen Charlotte's, patients were frequently admitted in labor with infective vaginitis, and it has not always been possible to disinfect these severe cases in time. He asked if Dr. Boxall had met with the same difficulty, and, if so, how he had so successfully dealt with them.

Chart VI.—Death-rate from Accidents of Childbirth in London, England and Wales, Scotland and Ireland.

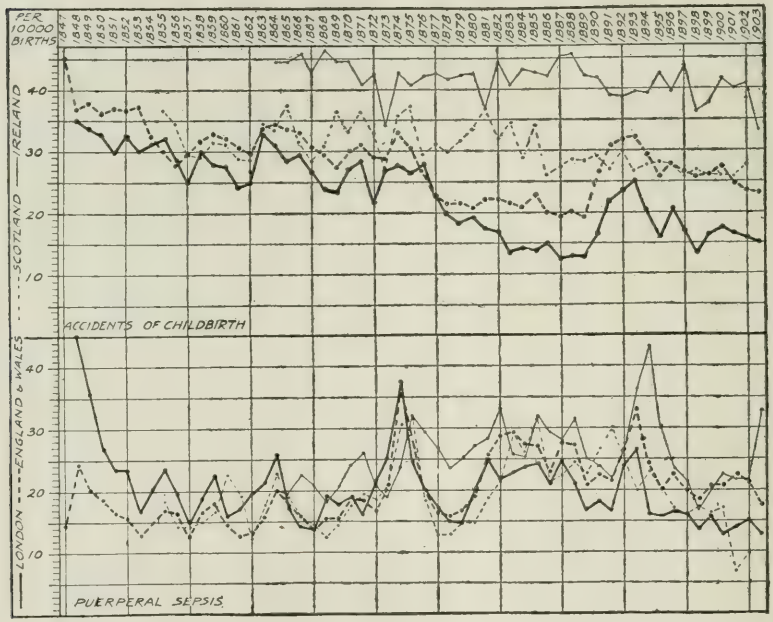


Chart VII.—Death-rate from Puerperal Sepsis in London, England and Wales, Scotland and Ireland.

Dr. C. O. Fowler alluded to the difficulty met with by medical practitioners in controlling the engagement of nurses for confinement cases in private practice. He considered that a nurse should never be asked to give a douche unless she had had a proper training. He deprecated the practice which largely prevailed of nurses endeavoring to get the case over before the arrival of the doctor. He knew it was a common practice among some of those who ostensibly professed to follow aseptic methods and to disinfect their hands before making a vaginal examination, to

handle various articles between the disinfection and the examination, regardless of the risk of reinfecting them.

Dr. Cullingworth related the circumstances under which, on his initiative, salufer had, for a time, been used as a douche and for washing the external genitals. He was still in doubt as to whether the occurrence of sepsis just at that particular time was really due to the use of salufer. Of course, salufer itself could not convey infection, and if it was the cause of the outbreak, it could only be so indirectly, owing to the discontinuance of douching with corrosive sublimate. He could not believe that possible. The charts and table given in the paper provided material upon which others could build. The great value of the paper, to his mind, was that it once more emphasized the unpleasant fact that while, in lying-in hospitals, sepsis had for all practical purposes been eliminated, the presence of puerperal septicemia in the country generally was just as great as ever. He quite agreed with the position taken up by the president in his inaugural address. He believed that the great hope lay in the direction of better clinical instruction both for medical students and for midwives. He should rejoice if the passing of the midwives Act had the effect of indirectly calling attention to the conditions under which English medical students obtained their practical instruction in midwifery, and of bringing about a much needed reform.

Dr. Purslow thought that the great importance of cleansing and disinfecting the vulva of the purturient woman was sometimes apt to be neglected in private practice.

Dr. Boxall, in reply, said that he hoped, for the sake of humanity, that Dr. Galabin's criticism would prove correct. The evidence of the disastrous effect of salufer as a douche rested not on the mortality so much as on the morbidity records as evidenced by the temperature charts. This, to his mind, appeared conclusive, and warranted the belief that it is better to omit the douche altogether than to use with it an inefficient antiseptic. He considered that a nurse, unless properly trained, should never be allowed to administer a douche after delivery. In his experience also notification of puerperal fever was rarely made till death was imminent. The Notification Act has been practically inoperative in many places, as far as puerperal fever is concerned. Recognizing the futility of attempting to determine the presence of gonorrheal and of septic matter in the vagina in the case of patients admitted to hospitals during labor, the practice is made of disinfecting the vulva and vagina, if possible before delivery, and of douching with an antiseptic solution immediately afterwards. Under this treatment, rarely do ophthalmia cases occur. He had never seen a septic case in hospital which was attributed to gonorrhea. It was satisfactory to find such a general consensus of opinion among Fellows of the Society as to the necessity of improving the clinical teaching of the medical student in midwifery.

REPEATED TUBAL PREGNANCY.

Dr. C. E. Purslow read a short account of a case in which he had operated twice. On each occasion there was intraperitoneal hemorrhage from the fimbriated extremity of the tube, after the patient had gone exactly a fortnight over the period.

Mr. Alban Doran referred to a case in his own practice which had symptoms of tubal abortion on the right side, and in which he operated a year later for tubal gestation on the left. He then found evidence of the former pregnancy.

Dr. Herbert R. Spencer said he thought that repeated tubal pregnancy was not so rare. He had himself operated on three cases, although he did not usually operate in early tubal gestation. In two of the three cases he had operated once, in the other twice, removing the two moles in each case.

Dr. Cullingworth thought that the general opinion of the Society would be against the removal of the second and unaffected tube as a precautionary measure, and that it was altogether unjustifiable.

ACUTE GENERAL GONOCOCCIC PERITONITIS.

Mr. A. G. R. Foulerton showed microscropic specimens from a case of acute peritonitis in which cultures of micrococcus gonorrhea had also been obtained from the peritoneal exudation. The tubes and ovaries of both sides were removed by operation. The micrococcus gonorrhea was found in the vaginal discharge and also in pure culture in the pus contained in the tubes. Histologically, the lining epithelium of the tubes showed but little change, and a careful examination had so far failed to show any penetration of the gonococci either into the epithelial cells themselves or below the epithelial lining. He thought that infection of the peritoneum had been brought about by an acute kink near the middle of the right tube. The ostium abdominale of the left tube was apparently closed.

Dr. Cullingworth could not agree with Mr. Foulerton's explanation of the peritoneal infection resulting from kinking of the tube.

Dr. Victor Bonney showed an ovarian cyst which had undergone axial rotation and rupture and also of the uterus affected by semimalignant overgrowth of the endometrium.

Dr. Munro-Kerr showed a myoma of the uterus which had become invaded by a carcinoma which had arisen in the body of the uterus, and also a microscopic slide from a case of carcinoma of the cervix of the uterus complicating labor at term. The fetus was removed by Cesarean section through a fundal incision. Subsequently the whole uterus was removed by the vagina.

Dr. Spencer said he considered the fundal incision a mistake. He thought, with Olshausen, that the wound should be closed by suture, with a view to preventing infection of the peritoneum. He hoped that the result of the case would be recorded when sufficient time had elapsed to judge of it.

Meeting of June 7, 1905.

The President, W. R. Dakin, M.D., F. R. C. P., *in the Chair.*

PUERPERAL ECLAMPSIA.

Surg. Capt. J. C. Holdich-Leicester, I.M.S., of Calcutta, reported a case of eclampsia, with death on the sixteenth day after delivery, from general septic peritonitis, due to rupture of an abscess in the spleen.

REPEATED TUBAL PREGNANCY.

Mr. Alban Doran reported a case which had twice been under his observation in hospital, with clinical evidence of tubal gestation, first on the right side and, after an interval of 12 months, on the left. Owing to increasing swelling, with pain and hemorrhage, the abdomen was opened and clots, together with both tubes and the right ovary, were removed. The patient was the subject of pulmonary phthisis, to which she ultimately succumbed 13 months after the operation. Mr. Doran raised the question whether, in view of the possibility of another abnormal pregnancy taking place, it is justifiable in operating for tubal gestation to remove the opposite tube even when healthy. He quoted three cases of his own, in which a normal uterine pregnancy had followed removal of a pregnant tube.

Dr. Boxall mentioned a case in which a normal pregnancy and delivery occurred about a year subsequent to removal of a ruptured tubal gestation.

Dr. Herbert Spencer said he had operated on three cases of bilateral tubal pregnancy, and in two others had observed intrauterine pregnancy after tubal gestation.

Mrs. Scharlieb mentioned a case of ruptured ectopic gestation operated on in July last, the patient being now five months pregnant.

Lieut.-Col. Sturmer, I.M.S., referred to the case which he had recently brought before the society, in which, at the time of operation, the opposite tube was found red and swollen, but was not removed. A year later it was discovered that ectopic pregnancy had again occurred. He, consequently, thought that it would have been safer to have removed both tubes at the first operation.

Mr. Doran, in reply, said that every conceivable variation had been observed in cases of tubal pregnancy—repeated in the opposite side, repeated in the same side, simultaneous in the right and left tubes, simultaneous tubal and uterine pregnancy, and, lastly, gestation in a tubal stump. Still, the evidence of those who had joined in the discussion supported his opinion that when pregnancy

occurred after the removal of a tubal gestation sac it was, as a rule, normal; hence, when the sac was removed it was not justifiable to amputate the opposite tube.

THYROID-LIKE STRUCTURES IN OVARIAN CYSTS.

Dr. R. Hamilton Bell reported two instances of this rare phenomenon. In both cases the cysts were multiocular and had been removed by operation. They showed in each instance appearances resembling those of the thyroid gland. An explanation was doubtless to be found among the following: (1) Metastatic growth from a primary thyroidal carcinoma; (2) secondary growth from a normal thyroid gland, or from a simple goiter; (3) growth of a teratomatous nature; (4) endothelioma; (5) colloid degeneration of an ordinary cystic adenoma of the ovary. He was disposed to regard the last mentioned as the most probable explanation.

Dr. Williamson agreed that in many cases the resemblance to thyroid tissue was brought about as the result of pressure exerted by colloid contents in the smaller loculi upon the columnar epithelium of an adenoma of the ovary. But, at the same time, he thought it possible that in some cases an explanation was to be found in a teratomatous origin.

DEFORMED FETUS.

Mr. Charles Singer exhibited and described a case of extreme ectopia vesicae and congenital absence of the colon, combined with other deformities in a full-time fetus which had lived for fourteen days.

RUPTURED INTERSTITIAL PREGNANCY.

Dr. Russell Andrews recorded a case of pregnancy in the left cornu of the uterus, which had undergone early rupture. The period was but six days overdue and the gestation cavity would but just admit the tip of one's thumb. The uterus was removed by supravaginal amputation, both ovaries being left. But he raised the question of the possibility of preserving the uterus in cases like this where rupture took place early, merely excising the affected cornu and suturing together the resulting raw surfaces.

PRIMARY CARCINOMA OF BOTH FALLOPIAN TUBES.

Dr. Cullingworth showed and described these specimens, which he had removed by operation from a woman 41 years of age. For two years previous she had had almost continuous pelvic discomfort, with frequency of micturition and a constant and increasing watery discharge, sometimes blood-stained, and frequently offensive. The diagnosis was obscure. A month's rest in bed having been followed by no apparent benefit, operation was decided upon. When the preliminary enema was given, about a pint of bright blood was passed by the bowel, and under anesthesia a small fistulous opening was felt in the rectum, four inches from the anus. On opening the abdomen both tubes were found to be af-

fected with malignant disease, the left being much the larger; but the uterus was of normal size and no extension of the disease to other parts in the abdomen could be felt. There was no ascites. It was thought that the fistulous opening into the bowel would supply a sufficient drainage. Subsequently some difficulty was experienced in getting the bowels to act. The patient died suddenly 84 hours after the operation.

Mr. Doran thought it probable that the cancer had developed, as is often the case, in an old hydrosalpynx.

REVIEWS.

A Text-Book of Obstetrics. By Adam H. Wright, M.D., Professor of Obstetrics, University of Toronto, Obstetrician and Gynecologist to the General Hospital, Toronto, Canada. With 224 illustrations in the text. New York and London: D. Appleton and Company, 1905.

In his preface, the author states his conviction that a treatise on obstetrics "should be practical in the broadest sense of the word." The reader will find his book filled with suggestions and ideas of the greatest practical benefit. With the student, the work will be popular because it is written in an easy conversational style, while to the busy practitioner, the clinical method of writing will especially appeal. The chapters on anatomy and physiology are brief, as the author realizes that students have already learned anatomy and physiology. He has, therefore, given only a summary of facts which are important from an obstetrical standpoint. Considerable space has been devoted to the subject of pelvimetry, the value of which is well recognized. The chapter on the hygiene and management of pregnancy is very short, in fact too brief when one considers the importance of the subject. When speaking of the physiology of labor, the author states that in primiparæ, the cervix is fairly long at the commencement of the first stage of labor, the external and the internal os being almost, if not entirely, in their normal condition. On the other hand, how frequently it is the case that the internal os has been obliterated, the head being well down in the cervical canal! In the chapter on the management of labor, the author has given a great many practical points. His ideas as to when the patient in labor may safely be left, the use of anesthetics, etc., are exceedingly interesting and valuable. On the other hand, no mention of the importance of listening to the fetal heart during the first stage is made, nor does the author state whether he uses rubber gloves, gives ergot after the third stage, or uses a post-partum douche. Dr. Wright uses chloral in many cases of labor with most satisfactory results. After labor, the patient is kept in bed for a time, varying from nine to fourteen days, but walking is not allowed until three weeks have elapsed, and she is not to do much work for six weeks. The fetal mortality

in breech deliveries is given at 7 to 10 per cent. in the practice of skilled accoucheurs, while the author quotes Herman in saying that the rate in unskilled hands exceeds 20 per cent. His experience leads him to believe that many physicians neglect to use proper methods in managing breech cases, and yet, while realizing the danger of these deliveries, he advises the practitioner to make no attempt at external version. In our opinion the conversion into a vertex presentation should always be tried. There is an interesting chapter on cardiac diseases in pregnancy, and the author believes that chloroform is not dangerous in the management of labor in these cases. He takes the ground that nephritis as a rule does not cause eclampsia, although it may cause uremia without convulsions. The pathology of eclampsia is very brief in the light of recent findings. In the treatment of eclampsia, he relies upon morphine, chloral, chloroform, catharsis, and the use of high saline enemata, but his results with veratrum have been negative. He warns against the use of pilocarpin. In acute or chronic nephritis with eclampsia, interference with pregnancy is not advisable or justifiable, except as a last resort, when the patient's life is endangered. However, where the emptying of the uterus is a simple matter, he thinks it better to do it. The chapter on ectopic gestation deals ably with the complication. In speaking of cases of dry labor, the author states that in the majority of cases the occiput is turned to the rear. He gives chloral to these cases as soon as pains begin, but no mention of the use of bags is made. In the management of occiput posterior, he advises manual rotation, considering forceps less effective and more dangerous. We know that results with forceps are very satisfactory. In the chapter on sepsis many interesting cases are quoted. Obstetric operations are considered in a very practical way, the author taking up first the general procedures, such as the use of the hypodermic needle, catheterization, infusion, douching, etc. He sutures the cervix at the time of labor only in case of hemorrhage, believing that in the great majority of cases cervical tears are better left alone. In the treatment of placenta previa, the author calls attention to the danger of rupturing the uterus by forcible dilatation. He claims that it should never be done. The chapter on version is very short, and much more could have been said about such a frequently used procedure. The chapter on forceps is full of good points. The author thinks the maximum duration for the second stage in primiparæ should be three hours, in miltiparæ, two, and also that not less than twenty to thirty minutes are to be employed in extracting a head after it has reached the pelvic floor, in the case of a primpara at least. He believes it not unlikely that Porro's operation and symphyseotomy will soon be obsolete. In the near future, when we cannot safely deliver by forceps or version, Cesarean section will be the operation of election in the great majority of cases. When the child is dead embryotomy, of course, should be used. We congratulate the author in producing an eminently practical and useful work. G. L. B.

Introduction à l'Etude clinique et à la Pratique des Accouchements. Anatomie, Présentations et Positions, Mécanisme, Toucher, Manœuvres, Extraction du Siège, Version, Forceps. Par le Professeur L. H. Farabeuf et le Dr. Henri Varnier. Pp. 477; avec répétitions nécessaires, 362 figures. Nouvelle édition revue et corrigée. Paris: G. Steinheil, 1904.

The original edition, published in 1891, was the result of five years' observation and experiments with the bodies of women and infants embalmed in glycerin, and verification of the conclusions at the time by clinical work. The revised edition also is devoted to the fundamental principles of obstetrics; the anatomy of the parturient canal and of the fetus, positions and presentations, the mechanism of labor in all presentations, palpation and diagnosis of presentation, manual treatment of breech cases, version and the forceps. The last three subjects are very fully treated and fill nearly half the volume. Though the work has long been out of print, its classical illustrations are well known through their reproduction by other writers. The correct methods of procedure are emphasized by illustrations showing the results of improper technique.

Treatise on Orthopedic Surgery. By Edward H. Bradford, M.D., Surgeon to the Boston Children's Hospital; Consulting Surgeon to the Boston City Hospital; Professor of Orthopedic Surgery, Harvard Medical School, and Robert W. Lovett, M.D., Surgeon to the Infants' Hospital and to the Peabody Home for Crippled Children; Assistant Surgeon to the Boston Children's Hospital; Assistant in Orthopedic Surgery, Harvard Medical School. Third Edition. Pp. 669. Illustrated by 592 engravings. New York; William Wood and Company, 1905.

We extend a warm welcome to a work which has not merely reached its third edition, but has done so deservedly. Since the appearance of the second edition, in 1899, many advances have been made in orthopedic surgery. The chief revision has been in the chapters on congenital dislocation of the hip-joint, the treatment of which has recently excited such general interest, on scoliosis, traumatic and non-traumatic coxa vara, and non-tuberculous joint diseases. A most useful addition is the chapter giving practical details of orthopedic apparatus. Like the rest of the volume this is carefully illustrated, and in few subjects are illustrations of greater value than in this branch of surgery which deals with deformities. Without entering into a discussion of individual points in the volume we can recommend it unqualifiedly to the practitioner. H. D.

Wurmfortsatzentzündung und Frauenleiden. By Dr. Theodor Landau, Berlin. Pp. 82. Berlin: August Hirschwald, 1904.

In the first chapter of this monograph the anatomy and variable positions sometimes occupied by the appendix are described. Quotations from other authors are liberally employed. Colon bacilli

become especially dangerous when there is a marked venous stasis in the wall of the appendix vermiformis. In classifying appendicitis pathologically, we may speak of a bacterial and of a non-bacterial inflammation. Anatomically the process is best divided into endoappendicitis, mesoappendicitis, and periappendicitis, and to describe the variety more definitely the required adjective may be added, as: catarrhal, serous, simple, hemorrhagic, fibrous, purulent, putrid, ulcerative, phlegmonous, gangrenous, and perforative. Clinically we speak of acute, chronic, and recurrent appendicitis. McBurney's point as the seat of maximum tenderness, is entirely eliminated by the author. It may occasionally occur, but the tenderness of the entire right iliac fossa is more important. Edebohls' claim to be able to palpate a normal appendix is called fantastic; it is not possible to accurately palpate this structure when normal. In virgins in whom an infection of the genitals may be excluded, and in whom a rectal examination, strengthened by an accurate history, shows an absence of genuine tumors of the genitals, the presence of a pelvic abscess may be looked upon as caused by appendicitis. The probable existence of appendicitis must be thought of in women who have passed the menopause and whose genitals are atrophic, if they have a circumscribed painful area in the right iliac fossa; also in persons who have had the right adnexa removed, if there is absence of a pedicle or other inflammatory exudate and of the signs of hysteria. The writer gives a list of fifty-seven ailments in women from which the differential diagnosis must be made. It is impossible to differentiate symptomatically appendicitis from an acutely inflamed tube. The history in such cases is of importance. In all laparotomies the appendix should be examined, and if evidence of pathological changes are found it should be extirpated. All cases of chronic appendicitis should be operated upon if symptoms manifest themselves. The monograph is brief and contains all essential points relating to appendicitis, either alone or in connection with the diseases peculiar to women. It is an excellent review of known facts, and it can be profitably read by any physician. H. J. B.

Surgical Diagnosis. A Manual for Practitioners of Medicine and Surgery. By Otto G. T. Kiliani, M.D., Surgeon to the German Hospital, Member of the New York Surgical Society, etc. Pp. 449. Illustrated by 59 full-page plates, and by engravings in the text. New York: William Wood and Company, 1905.

This work is written with the object of aiding the general practitioner in the diagnosis of surgical affections and in the decision as to the necessity for operative treatment in each case. The author makes no claim of originality as regards the subjects presented, and has given his personal opinion concerning only those surgical questions which are too recent to have been definitely settled. The merit of the volume consists in its presentation of the subject of diagnosis in a fairly compact form. To further this object the writer has utilized heavy type for many of the important

words, and a marginal note of the contents of each paragraph. The too frequent use of heavy type is the most unfortunate feature of the work, as it subordinates the subheadings, which are in the same font, and is so extensively employed as to lose force and confuse the eye. The various affections are grouped systematically under the headings of congenital malformations, injuries, and diseases of each anatomical region, and of each viscus, from the head downward. The volume contains much that is of practical value, systematically and usually concisely arranged H. D. . .

A Text-Book on the Practice of Medicine. For Students and Practitioners. By James Magoffin French, A.M., M.D., Formerly Lecturer on the Theory and Practice of Medicine, Medical College of Ohio. Second, Revised Edition. Pp. 780. Illustrated by 11 full-page plates and 50 wood engravings. New York: William Wood and Company, 1905.

A review of this excellent work for students would be but a repetition of what was said of the first edition in this journal for March, 1904. The actual progress of medical science has been so limited since that edition appeared that few additions have been needed to keep the volume abreast of the times. Aside from a rearrangement of the order of chapters on contagious diseases—smallpox, chickenpox, scarlet fever, measles, "fourth disease," malaria, and dysentery being grouped as of protozoan origin—practically the only changes of importance are in the chapter on ankylostomiasis, the suggestion of the discovery of the parasite of scarlet fever, and some notes on tropical diseases. As was stated in the former review, the work "is distinctly practical; the pathology is sufficiently thorough, the symptomatology clear, the treatment as a rule sound and conservative." H. D.

Die physiologischen und pathologischen Beziehungen der weiblichen Sexualorgane zum Tractus intestinalis und besonders zum Magen. By Dr. Erwin Kehrer, Instructor and Assistant in the University Gynecological Clinic, Heidelberg. Pp. 215. Berlin: S. Karger, 1905.

The most important results of the author's studies, recorded in this monograph, may be briefly stated as follows: The hydrochloric acid secretion of the stomach during menstruation is at times diminished, at others unchanged, and again it may be increased. It is diminished after profuse bleeding; unchanged or moderately diminished in healthy individuals with menstrual bleeding of moderate intensity; somewhat increased in nervous women with slight or moderate flow. Emptying the stomach with Kussmaul's stomach tube does not influence the continuance of pregnancy. During the first six months of gestation the secretion of hydrochloric acid is, as a rule, somewhat diminished. From the seventh to the tenth month a slight degree of hypochlorhydria and subacidity is the rule. The motility of the stomach is, as a rule, not changed during pregnancy. In only 16.6 per cent. of the cases was it found diminished. The physiological loss of blood during

delivery corresponds to the physiological diminution of the secretory function of the stomach in the beginning of the puerperium. Severe puerperal bleeding, as a rule, leads to further diminution of acid secretion. The hydrochloric acid content becomes normal about the fifth day after delivery, the total acidity about the seventh day. Until the eleventh day a continuous increase of acidity takes place. The motor function of the stomach is frequently diminished at the beginning of the puerperium. An alteration of gastric motility after large losses of blood during delivery was not noticeable. In one-half of the cases the motor function was normal, and in the remaining half it was diminished. Ptyalism and hyperemesis gravidarum are complicated reflex neuroses, dependent upon the increased irritability of the central nervous system. The change in the central nervous system is probably caused by an embryogenic toxemia of pregnancy. The varying acid-findings in pernicious hyperemesis, and also the variable findings of ptyalin and potassium sulphocyanate in ptyalism also speak in favor of a neurosis. The territory of gastric neuroses arising from the genital sphere outside of pregnancy is limited. Menorrhagia and metrorrhagia caused by tumors, displacements, and inflammation of the uterus and adnexa usually lead to diminished acid secretion. In women with carcinoma of the genitals the hydrochloric acid secretion is sometimes diminished to the point of achlorhydria. Not only bilateral, but also clinically apparently single ovarian cancers, are frequently metastases of primary stomach or intestinal cancers. Such metastasis occurs more frequently through intraperitoneal implantation, than by the lymphatic route. In every instance of vomiting in connection with ovarian tumors, one should consider not only twisted pedicle with peritoneal adhesions, but also the possibility of cancer of the stomach. One should never remove an ovarian tumor, if suspicious of malignancy, without determining the stomach function, and examining the cervical supra- and infraclavicular glands. We commend this monograph to all who are interested in this line of research. It is a most painstaking clinical study. H. J. B.

Ueber puerperale Eklampsie By Emil Polak, M. D., Vienna. Pp. 172. Leipzig and Vienna: Franz Deuticke, 1904.

In this monograph the author reviews his laudable work in endeavoring to shed more light on the causes and lesions of eclampsia. All that has been published by other authors is given critical consideration. It must be corroborated that eclampsia occurs most frequently in primiparæ; also that delivery has a favorable influence on the seizures. Albumen is present in the urine of most patients. Premature delivery occurs frequently. Eclamptic seizures have, however, been observed from seven days to eight weeks after delivery. The mortality varies with different authors, from 19.93 to 6.3 per cent. There are tabulated 130 autopsies of patients who died in the Weiner allgemeines Krankenhaus. The kidneys were diseased in 98.46 per cent. of the cases. Dilatation of one or both ureters occurred in 26.92 per cent. In

only six cases was the liver found normal. The brain was examined in ninety-nine cases, and anemia was present in 21.21 per cent. of these. Edema in acute or chronic form was found in 59 per cent. Hyperemia existed in 13.13 per cent. The heart was found normal in only 7.84 per cent, of 102 cases examined. Parenchymatous degeneration of the myocardium was present in 29.78 per cent.; fatty degeneration in 32.98 per cent. Eccentric hypertrophy and dilatation of the left ventricle were found in 25.53 per cent. At the present time the theory of the poisoning of the maternal organism through toxic albuminoids originating in the fetus is most generally accepted. H. J. B.

Zur Lehre von den Blutgefässen der normalen und kranken Gebärmutter. By Dr. Richard Freund, Instructor in University of Halle. Pp. 86, with 26 colored illustrations. Jena: Gustav Fischer, 1904.

This exceedingly interesting and painstaking study is based upon the examination of thirty-four uteri, and the subjects from whom these were obtained varied from premature infants to adults. Uteri obtained by vaginal extirpation require more time for preparation, and are not quite as useful as those obtained by abdominal extirpation or by post-mortem. For the study of normal blood-vessel relations, uteri that have never been impregnated are preferable. Myomata the size of a hazelnut do not cause stasis if they are situated outside of the zone of the larger blood-vessels. Larger ones, the size of a fist, do interfere with the circulation. Cancer particles are rarely transported by means of the venous circulation. The lymph channels are the principal means of transmission. Most authors ascribe uterine bleeding to changes in the blood-vessels. The causes so far known can only be considered as problematical. Only in cases of cancer of the uterus can we find a satisfactory anatomical explanation of the bleeding. The illustrations accompanying the monograph are superb, and their explanatory text leaves nothing to be desired. H. J. B.

Die Bekämpfung des Uteruskrebses. Ein Wort an alle Krebsoperateure. By Dr. Georg Winter, Professor and Director of the University Gynecological Clinic, Koenigsberg. Stuttgart: Ferdinand Enke, 1904.

The object of this monograph is to call attention to the necessity of making an early diagnosis, and of always making a vaginal examination in instances of atypical bleeding from the genitals. Those who are in doubt should invariably consult a specialist. Once the diagnosis of cancer has been made the patient should invariably be referred to an operator. Cancer of the uterus is permanently curable if the diagnosis is made sufficiently early and the operation is properly performed in time. It is the duty of teachers to insist upon the above essentials. All women who have symptoms referable to the lower abdomen should be gynecologically examined. Further, the attention of the laity is called to the early symptoms of cancer of the uterus, and women who have any symptoms

referable to the pelvic organs are requested to consult a physician and be examined. All surgeons are requested to promulgate the points to which the author refers in his monograph. The technic of excising a piece of the suspicious vaginal portion and of making a curettage for diagnostic purposes, and the method of examining such specimens is also described. H. J. B.

Les Degenérescences des Fibromyomes de l'Utérus. Par G. Piquand, Ancien Interne Lauréat des Hôpitaux, Prosecteur Provisione à la Faculté de Médecine. Pp. 426. Paris: G. Steinbeil, 1905.

In this extensive monograph the author studies the various forms of degeneration to which uterine fibromyomata are subject, both simple forms and those secondary to infection of the tumors. He finds that a little over 30 per cent. of fibromata shows degenerative changes, and that of each 100 instances of degeneration 33 are fibrous; 10 calcareous; 25 edematous; 6 sarcomatous; 4 necrobiotic; 3 suppurative; 3 gangrenous; 9 show coexistence of epithelioma; and 7, of fibrocystic tumors. All forms of degeneration are most common between 40 and 55 years. He concludes that while the menopause may bring amelioration of functional troubles or occasionally a diminution in size of the fibroma, the period preceding it is one of danger, and whenever possible these patients should be operated upon before this time.

Les Vaisseaux sanguins des Organes génito-urinaires du Périnée et du Pelvis. Amplification de la thèse du Dr. Leon Cerf, avec 33 figures inédites, par L. H. Farabeuf. Pp. 214. Paris: Masson et Cie., 1905.

This work is a considerable enlargement by the author of the thesis of one of his pupils. The laborious foundation was the study of many dissections of injected specimens, male, female, and of the lower animals. The feature which is chiefly emphasized is the exact correspondence of all vessels in the male and female types.

Atlas d'Anatomie obstétricale. Par le Dr. Jean Carbonelli, Accoucheur de la Matérnité Royale de Turin, Professeur P., à l'Université de Turin. Paris: Librarie J. B. Baillière et Fils. Turin: Renzo Streglio et Cie, 1905.

This atlas consists of colored plates of frozen sections of two pregnant women. The first eleven are coronal sections of the abdomen containing the gravid uterus of a primipara who died when five and a half months pregnant. Nine other plates represent transverse sections of a multipara who died just before term.

Des Grossesses tubaires méconnues. Par le Dr. Henri Bazalgette, Ancien Externe des Hôpitaux de Paris. Pp. 191. Paris: Vigot Frères, 1905.

In this monograph the writer brings together a number of both new and previously published cases of ectopic gestation, showing first the various clinical pictures which it may present and the

different conditions for which it has been mistaken. The complications which may occur and the errors of diagnosis to which these may lead are also considered. Finally the individual symptoms of tubal pregnancy are analyzed and a diagnostic symptom-complex is deduced.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Changes in the Normally Located Placenta in Cases of Premature Detachment.—Guido Blancardi (*Annali di Ostet. e Gin.*, May), gives the results of the histological examination of a number of cases of premature detachment of the normally implanted placenta. Such lesions as are found are due to the continuance during pregnancy of a previously existing endometritis, and may account for some of the symptoms which are peculiar to such cases. The abnormal placental conditions that he found existing were due primarily to fatty degeneration of the placenta. This condition was accompanied by inflammatory conditions, secondary extravasations of blood, and alterations of the villi, with changes in the fetal structures as well. These alterations differ in no way from similar lesions due to other pathological conditions of the placenta arising from other causes. When there seems to be no apparent reason for early detachment of the placenta we may account for it by the presence of an endometritis resulting in such changes.

Appendicitis During Pregnancy.—Karl W. Doege (*Milwaukee Med. Jour.* July) finds appendicitis during pregnancy is more dangerous than in the non-pregnant state. All acute attacks should be operated during the first twenty-four hours. A young woman who has had appendicitis and contemplates marriage, or a married woman in the child-bearing period, should have her appendix removed before pregnancy. The possibility of an appendicitis after labor in predisposed patients should be borne in mind, in order not to mistake such an occurrence for puerperal sepsis.

Ectopic Gestation.—Samuel M. Brickner (*Med. Rec.*, Aug. 12) concludes that sterility does not necessarily precede the development of ectopic pregnancy. The main characteristic of the bleeding is its great irregularity, and its character and profuseness have no relation to the type of the lesion. The uterine flow has apparently no connection with the death of the fetus. The pain in tubal pregnancy is usually localized over the site of the lesion and has no definite character. The pain during a tubal abortion and that concomitant with the presence of a hematosalpinx are generally cramp-like. The usual symptoms of pregnancy may be present, but are frequently absent. Tenderness on palpation of the mass adjacent to the uterus is of great diagnostic value when taken in connection with the history and other pelvic findings. A rise of temperature to between 99° and 100° F. in the absence of injection is worthy of consideration as a diagnostic factor. The causative

factors of this condition are probably numerous, and it is likely that atavistic tendencies, congenital or acquired anomalies, pelvic inflammations, ovarian and tubal disease all play a rôle in individual cases, but no one of these factors alone is sufficient to explain all cases.

Serious Puerperal Anemia.—I. Clivio (*Ann. di Ostet. e Gin.*, June) details his observations made on twenty-five cases of grave anemia in the puerperal state, seen by him in the Maternity Hospital at Parma. The amount of iron in the blood of these patients has been carefully studied, as well as in normal individuals. The cases considered were not affected by ordinary degrees of anemia, but by pernicious and chloranemia. They were taken from a region where anemia is frequent; at the same time they were of a more severe form than is found in men, or in women who are not pregnant, and several of the cases were so far advanced that it was impossible to make them respond to any treatment, and a fatal issue resulted. The author believes that the condition of pregnancy, with the additional demands on the system made by the necessity of nourishing the child, as well as the poisonous products that arise from the nutrition of the fetus, rendered it impossible for the mother to survive the ordeal. In many of the cases the gastrointestinal troubles were severe, and obstinate vomiting and diarrhea contributed to the fatal anemia. When labor was completed naturally the anemia began at once to be relieved, and at so rapid a rate that it was impossible not to believe that the continuance of pregnancy aggravated the condition. This amelioration was in spite of the drain of lactation and the lochia. One of the causes of the anemia the author believes to be the bearing of many children, as most of the cases were in multiparæ. Another was the long lactation that is the custom in that region. The fatal results were due to gastrointestinal insufficiency, and there was true atrophy of the stomach and intestine. The patients were noted to have small power to resist the ordinary processes of fermentation. They had rise of temperature, also. The lochia became fetid, and the condition of anemia was aggravated by the local changes. There was an increase in size of the spleen, especially in the severe cases. The treatment of the cases was both medical and obstetrical; the induction of premature labor became necessary in many, to save the life of the mother, and this was justified by the immediate improvement in the patient's condition after the uterus was empty. The author concludes thus: (1) Pregnancy has a marked influence on anemia when of some degree of severity, and simple anemia is changed to the pernicious form. This is due to the feto-placental changes, and is marked in the last three months of gestation. (2) The resistance of the organism to putrefactive changes is much lessened, and there is marked destruction of the red blood corpuscles, as is shown by the enlargement of the spleen. (3) Treatment should be both medical and obstetrical. (4) Labor is easy and rapid. (5) Use of bone marrow is of real advantage.

Puerperal Pyemia the Result of the Staphylococcus Pyogenes Aureus Alone.—J. Schwetz (*Ann. de Gyn. et d'Obst.*, July) discusses the various forms of puerperal pyemia due to different microorganisms. They are the streptococcus, alone and in combination with the pneumococcus, gonococcus, bacterium coli, septic vibrio of Pasteur, staphylococcus albus and aureus. The staphylococcus has been found alone in twelve cases, of which the author publishes one. The others are always combined with the streptococcus. Streptococcus infections are always very grave. The infection caused by the staphylococcus has had a fatal result in all but two of the published cases. The infection with the gonococcus is somewhat less fatal, but may be very severe. The author believes that during life it is impossible to differentiate these various forms of infection by the clinical symptoms. Only a bacteriological examination will give the diagnosis. The treatment must also be affected by the bacteriological examination, since, if the infection is produced by the staphylococcus, the use of an antistreptococcic serum will be of no value, as in the author's case, where it was employed without result. Such a case would require a serum appropriate to counteract the staphylococcus, instead of the streptococcus, unless the infection were mixed. Pure staphylococcus infections are quite rare. Curetting and intrauterine treatment, after the infection has reached the veins and become generalized, is quite useless.

Operative Treatment of Puerperal Pyemia.—E. Bumm (*Berl. klin. Woch.*, July 3) draws attention to the rapid spread of the poison from an infected endometrium by way of the veins that connect with the uterine circulatory system. The streptococci may be carried in various directions; virulent forms are soon carried by the blood current to the spermatic plexus, and hypogastric veins, then into the iliac veins, the femorals, and the vena cava. Such septic phlebitis with infected areas and thromboses give the picture of an acute pyemia. The chills begin in the end of the first or the beginning of the second week of the puerperal period. The phlebitic process may begin in the uterine wall and the broad ligaments, then extend to the peritoneum and give symptoms of simple pyemia. If the streptococci are only slightly virulent the poison spreads more slowly; there is less tendency to pus formation, but inflammation occurs, and there is phlegmasia alba dolens or phlebitis of the pelvic veins. Again there may be a chronic pyemia: a single center spreads the poison slowly, peripherally. The chills begin three or four weeks after labor, there are pauses of several days between them; the endometritis is long cured, and the thrombosis is the only cause of trouble. Acute pyemia usually ends in death. The slower form is also often fatal. Of twenty-three cases beginning in the first week only four recovered, a mortality of 83 per cent. It is clear that local treatment of such an infection, by intrauterine douches, cannot aid. The process has passed beyond the uterine walls. The same is true of inunctions of silver salve. Turpentine injections are of doubtful value. The author saved

two out of four cases of puerperal pyemia treated by surgical interference, removing the thrombosed veins and thus taking away the local cause of the spread of the poison; of these he gives the histories. The diagnosis may often be made under ether, after the first chills, when the good condition of the uterus can be demonstrated by manual exploration, and the thrombus in the pelvic veins felt. Interference must be undertaken early, before the spread of the streptococci from the original focus in the veins. Ligation and excision of the inflamed veins may be done either extraperitoneally, through the abdominal wall at the eleventh rib, extending the incision to the middle of Poupart's ligament, or transperitoneally, by way of the abdominal incision. The extraperitoneal method avoids the danger of infecting the peritoneum, but makes a very deep wound and does not permit the following of the thrombotic process to its end. The transperitoneal may infect the peritoneum, but it gives a much better view of the pelvic contents. The spermatic veins are easily seen, and the hypogastric and common iliac may be followed. For a chronic pyemia, in which septic extensions from the wall of the vein are not to be feared, the transperitoneal method is to be preferred. Extirpation of the uterus is often unnecessary, as that organ is not affected.

GYNECOLOGY AND ABDOMINAL SURGERY.

Results of Ventrofixation of the Uterus.—F. Weindler (*Monatsschr. für Geb. und Gyn.,* June) sums up the results of the operations for ventrofixation of the uterus done by Leopold, from 1896 to 1903, fifty-one cases, and gives the final results of all cases that could be followed up and reexamined. He considers as cured any case that has a lasting result as to the improved position of the uterus, without any symptoms. Of the fifty-one cases operated on it was possible to reexamine thirty-two. Nine had passed from observation. Four had died from intercurrent diseases. The average duration since the operation was three years. Twenty women were between 20 and 30 years of age, twenty-two between 30 and 40, seven between 40 and 50, and two between 50 and 60. Thirty-three were of the working class, hence this is a good test of the results. All of them had gone through a long course of conservative treatment, by pessaries and other means, for the correction of the displacement, without success. Most of them came begging to be relieved from their sufferings by operation. Most of them were examined under ether before operation. It is found that there are many cases not suitable for operation, because there are present other conditions of primary importance that cannot be relieved by ventrofixation. Such are nervous and hysterical affections, as well as anemia and inflammation. Of the cases operated on, eight were simple, uncomplicated retroflexion; of these, four had metritis, four were virgins who were unable to work on account of dysmenorrhea. The author states that in private practice the pessary works well, but that with the hard-working classes it often fails to keep the uterus in position. Six

cases had also prolapsus; fifteen were fixed in retroflexion by adhesions, old cases of pelvic peritonitis or gonorrhea; 80 per cent. were complicated cases; and in fifteen, other operations were done at the same time. The uterus should be fixed two finger breadths above the symphysis pubis; it should be fixed by two silk sutures, since catgut does not hold so well. Infection need not be feared with modern technique and asepsis. To show that the operation is not dangerous the author enumerates 371 cases, published by various authors, without a single death. Recurrences are rare, almost unheard of in the practice of the author. Most of these patients could do hard work in the field or house soon after the operation. The adhesions to the abdominal wall are very firm, so that in case of necessity it is very difficult to separate them. They have stood the test of pregnancy and labor. When they give way it is the result of faulty technique. Many authors have expressed themselves as satisfied that this is the best operation for treatment of retroflexion. The physiological functions of the organs are not affected. Menstruation becomes normal and painless; conception is not interfered with; the swelling of the uterus in metritis disappears; the ovaries act normally. Eleven of the examined cases became pregnant soon after the operation. Several said that they felt well during pregnancy and had no pain from stretching the adhesions. Six cases of labor passed naturally without any interference. Atony is rare. The puerperal period was generally normal; the adhesions were not torn; the uterus was movable and in normal position. The patients stated that they felt well and strong, and were able to work at the menstrual periods, without backache, pain, or nervous symptoms. The author has had no case of hernia so far.

Calcification of Fibromyomata of the Uterus.—G. Piquand (*Ann. de Gyn. et d'Obst.*, June) says that the only factor of any importance in the etiology of calcification of fibromyomata of the uterus is age, this condition occurring after the menopause. It occurs almost exclusively in interstitial and sub-peritoneal, rarely in submucous fibroids; in polypi it is rare. The calcification may begin in the center or at the periphery, as a deposition of small calcareous granules which infiltrate the tissue; as they increase in size and number they crush out the other elements of the growth, the stroma becomes less and less, until there is little left but a mass of hard lime, surrounded by a sort of capsule. There is always some fibrous stroma between the calcareous plates. The muscle cells seem to be squeezed out of existence. There may be a primary fatty degeneration changing to calcareous degeneration later. The uterine arteries become thickened, rigid, and atheromatous, and this arterial degeneration plays the chief rôle in the degeneration. The principal symptoms are pain, which has previously been absent, compression of the bladder or rectum, and metrorrhagia or leucorrhea. The growth may be felt to have become very hard. It has even been mistaken for a fetal head. The termination is often in ulceration through the wall of rectum or bladder, or for-

mation of abscess. These complications are very grave, and the condition when recognized calls for operation, to prevent them. The tumors may be removed by vaginal or abdominal hysterectomy.

Hemorrhagic Adenomata of the Ovary.—O. Schaeffer (*Arch. für Gyn.*, Bd. 57, 905) tells us that the most important symptom of adenocystoma of the ovary is profuse and long-continued hemorrhages and these occur in young subjects as well as in those near the menopause. The treatment demanded is radical operation at an early date. The author has made careful examinations of the tumors in two cases operated on by him, and gives us the conclusions at which he has arrived as to the cause of the hemorrhages. In one case there had been seven weeks of severe hemorrhages. There was removed a cystadenoma of the right ovary, with a unilocular serous cyst and a hemorrhagic cyst of about the same size. The uterus was hyperemic. The other case showed an ovarian cyst with a perioophoritis and salpingitis, and a secondary hemorrhagic endometritis. This cyst had myxoid contents, with extravasations of blood into the contents, as well as into the walls of the cyst, and was adherent to the broad ligament. There were hemorrhages into the perivascular connective tissue of the papillæ, and about the capillaries, which were dilated, and the tumor walls had undergone degenerative changes. The hemorrhages resulted from the dilatation of the capillaries and the direct pressure of the degenerated myxoid contents, or from necrosis of the tissues surrounding the capillaries. Vasomotor circulatory changes may be primary, and changes in the connective tissue stroma secondary. The greatest changes were in the stroma of the papillæ and the glandular elements. High blood pressure in the capillaries caused extravasations, and marked hyperemia of the adenomatous tissues. This resulted in increased pressure in the cyst and degeneration of the epithelium of the cyst. After every hemorrhage in a cystoma the size of the growth is increased. The contents of the cyst increase by edema, the tension of the wall causes necrosis of the contents, and transudation and extravasation of blood into the cyst aid in increasing pressure, and this again reacts on the contents and increases necrosis; abscess formation and rise of temperature, and adhesive peritonitis follow.

Dermoid Cysts.—Georges Sneguireff (*Ann. de Gyn. et d'Obst.*, May) describes a case in which an operation was done for the removal of the uterus and adnexa, with a tumor the size of a mandarin orange behind the uterus. In one of the tubes was found a caseous mass. Near the ovary were found groups of sebaceous glands, islands of hyaline cartilage and epithelium of the pavement variety. Hence there was made a diagnosis of dermoid cyst or embryoma. Dermoid cysts are found in various locations in the body; near the orbit, at the base of the skull, on the neck, in the urinary bladder, and most often in the genital organs. Because they are most often composed of epidermic structures alone, they have been called dermoid cysts. Where they

contain, as in this case, structures derived from all three layers of the embryo and occur in the genital organs, they have been called embryomata. There are two theories as to the origin of these structures. The first is that they originate per se, that the cells of the feminine ovule are capable of forming tissues; this is the theory of parthenogenesis. This occurs among insects. The other group believe that there is necessary to their formation the fertilization of an ovum by the male. Embryomata have been found in the testicles of the male, a fact which favors the theory of parthenogenesis. If they arise by fertilization, the polar cell becomes fecundated, or the ovule itself is fertilized. The author holds that fecundation is indispensable to the formation of an embryoma, because a tissue organized on the normal type presupposes the union of cells of heterogeneous individuals. The author found that in his case the woman was the child of a very fertile mother, who had twice borne twins, of which the patient was one. He suggests that this fertility had descended to the daughter and produced the embryoma. These tumors form about 14.5 per cent. of cysts. They are most often found in the pelvis, and are recognized as a tumor which may cause pain. Sclerocystic degeneration of the ovary is the most frequent complication. Those cysts do not become carcinomatous.

Chronic Oöphoritis.— A. Theilhaber (*Münch. med. Woch.*, June 13) argues for the rarity of primary chronic oöphoritis, believing that the condition is usually secondary to metritis or to tubal disease. The symptom enlargement is of little value in diagnosis, because normal ovaries are often enlarged, especially at the menstrual period. The changes in the ovaries are so variable that no dependence can be placed on the structure as a means of diagnosis. Localized pain is frequent in many other pelvic conditions, and tenderness on pressure is unreliable. So are pain and hemorrhage at menstruation, which occur in other conditions as well. The size of the ovary varies, as do the thickness of the tunica albuginea and the amount of connective tissue. Primordial follicles differ in number. Generally the ovarian condition is secondary to tubal lesions, inflammatory in nature.

Cysts of the Vagina.—Voituriez (*Jour. des Sciences méd. de Lille*, July 22) describes a case of vaginal cyst observed by him, and then enters into a description of the etiology, symptoms, and treatment. They are not rare, Neugebauer having published fifty cases of his own. The term must be confined to cysts of some size, with fluid contents, that tend to grow and affect function, in distinction from minute cysts which result from endometritis. They occur generally in young women, often after labor; they have also been observed when congenital, or found in very young children, so that they cannot be the result of excess of coition. They may be single or multiple; are usually lateral, oblong, and may be paracervical, retrovulvar, or may originate in the middle zone of the vagina. They always originate within the vagina, but project out of the vulva, and give the sensation of a foreign body, though

causing no pain, except when they render connection difficult and painful. They vary in size from a nut to the size of an egg, or even of a fetal head. They grow in the thickness of the vaginal wall, and projecting through the mucous membrane, thin it until it becomes transparent. The cyst wall itself is of fine, fibrillar connective tissue, lined with stratified columnar or ciliated epithelium. The contents may be clear or yellowish, viscid or thin, and, if inflammation has set in, will be purulent. They give no symptoms except painful coition, and are diagnosed by vaginal examination. There is no tendency to regression, but they go on growing until operated on.

Epithelioma of the Vulva.—Malignant growths of the external genitalia, according to Howard Dittrick (*Amer. Jour. Med. Sci.*, Aug.) are rare, occurring in only about 2 per cent. of gynecological patients. They are most frequent between the ages of 60 and 70. The disease usually begins on the labium majus and is seen most often on the right side. In type it may be vegetating or infiltrating, and may belong to one of four histological classes: scirrheus, medullary, carcinoma, cancroid, or melanocarcinoma. The most common symptom is itching. When ulceration takes place there is usually pain, more or less foul discharge, and bleeding, occasionally profuse hemorrhage. Dysuria is not uncommon. The average duration without operation is about two years after discovery of the tumor. The best treatment consists in early excision of the vulva with extensive dissection of the inguinal glands on both sides. The prognosis is bad, as the growth almost inevitably returns.

Pelvic Infection in Women.—Thomas J. Watkins (*Surg., Gyn. and Obst.*, Aug.) gives the following directions for the treatment of gonorrheal vulvovaginitis: (1) Keep the patient in the recumbent position. (2) Swab the diseased surface thoroughly with a 4 per cent. solution of silver nitrate every two or three days for one or two weeks. (3) Use one-half per cent. solution of lysol for vaginal douche three times daily. (4) Use five per cent. protargol in boroglycerite vaginal suppositories at bedtime. The above line of treatment should be effective in from one to two weeks. Vaginal douches should be used during the two or three menstrual periods following the infection. The treatment of acute endometritis of non-puerperal type should be palliative. In chronic endometritis curettage with topical applications is usually the only remedy that gives much relief. The treatment of an acute infection of the Fallopian tubes, ovaries and pelvic peritoneum in the non-puerperal state should be palliative because: Complete recovery may occur by absorption; there is not much danger to life at this time; the acute stage under proper treatment lasts only a short time; the dangers of operation are greater than in the chronic stage. The essentials in the acute stage are as follows: (1) Keep patient in bed. (2) An ice bag or hot water bag, preferably the former, is kept over the seat of pain. (3) Opiates for severe pain. (4) Bowels to be kept freely open.

Drainage after Laparotomy.—L. A. Ewald (*Med. News.*, June 10) rejects drainage in almost all gynecological operations. He advises it in those cases of persistent pus foci and in all cases of injury to the intestines, particularly when intestinal sutures seem not to be trusted. One can best guard against infection through careful indications for operation and operative procedure. All cases which show severe infection should be operated upon only when absolutely necessary, and then a preliminary vaginal incision should be made. Pus located intraperitoneally or in the parametrium is highly infectious. Pus from a pyosalpinx is sterile after nine months. When no immediate indication for operative interference exists, it is better to wait The following preventive measures should be carefully observed: Protection of the abdominal cavity with layers of gauze; careful separation of adhesions; removal of all visible pus; exact hemostasis, and rapid operative procedure.

Drainage in Diffuse Septic Peritonitis.—Van Buren Knott (*Ann. Surg.*, July) emphasizes the following points: (1) Operations for diffuse septic peritonitis should be performed as quickly and with as little manipulation as is compatible with thoroughness. (2) Evisceration, partial or complete, greatly increases shock and the prospects of a fatal result. (3) The generous use of clean, hot water will most thoroughly cleanse the infected cavity with the least traumatism. (4) Drainage is simplified by collecting the peritoneal fluid at one point where drains may be easily placed. The elevated head and trunk posture followed by the gravitation of fluid to the lower pelvis best accomplishes this. (5) Results following the surgical treatment of diffuse septic peritonitis will be improved should each individual operator adopt some definite form of procedure in such cases, which, being well understood by operator and assistants, may be methodically, speedily, and thoroughly carried out.

Intestinal Obstruction after Pelvic Operations.—Edred M. Corner (*Pract.*, Aug.) believes intestinal obstruction due to adhesions to the peritoneal cicatrix is more frequent after pelvic operations than other abdominal procedures. The operation which stands preeminent among all others is supravaginal hysterectomy. The occurrence of attacks of localized abdominal pain often associated with vomiting coming on after an abdominal operation, especially a pelvic one, should raise the question of the advisability of exploration. The writer suggests, as a means of obviating this occurrence, that in supravaginal hysterectomy a long posterior flap be made.

DISEASES OF CHILDREN.

Primary Jugular Bulb Thrombosis in Children.—J. F. McKernon (*N. Y. Med. Jour. and Phila. Med. Jour.*, July 1 and 8), in reporting six cases of primary jugular bulb thrombosis in children as a complication of acute purulent otitis media, says that the diagnosis of the condition is made almost entirely from the wide

temperature range following acute purulent otitis. The temperature may fluctuate violently between 97° and even 106°. During the elevations of temperature the children become irritable, then drowsy; during the remissions they feel well, ask for food, and wish to sit up and play. Operation during a remission is advised.

Influence of Feeding on Infant Mortality.—Deducting the children concerning whom no investigations could be made or who died of troubles not affected by feeding, W. J. Howarth (*Lancet*, July 22) tabulates 8,343 registered births in Derby, showing a death rate of 197.5 among the hand-fed infants, of 69.8 in breast-fed, and 98.7 in those both breast and artificially fed. His statistics appear to show that the use of sweetened condensed milk, either whole or skimmed, should be invariably discouraged, and whole unsweetened condensed milk should only be permitted when one is satisfied that the milk is being used with a proper degree of dilution and with the necessary additions, as in the case of modified cow's milk; also that since the death-rate among children reared on patent foods is, on the average, higher than among those fed on diluted cow's milk, every attempt should be made to encourage parents to use the latter, and to educate them to an appreciation of the necessity for the additions to, and the dilution of, cow's milk to render it suitable for infant's food. The addition of patent foods to the dietary of very young infants is unnecessary, sometimes dangerous, and always expensive. The risks to which hand-fed children are exposed are considerably minimized by mixed feeding. Therefore every mother who is unable fully to satisfy her infant should be encouraged to continue to feed her child and to supplement any deficiency by means of artificial food, and only in case of absolute and unavoidable necessity should resort be had to hand-feeding alone.

Fats in Relation to Infantile Marasmus.—The overwhelming majority of cases of infantile marasmus occur, according to H. Stern (*Arch. of Ped.*, June), in artificially nourished children, and the gastrointestinal disturbances are often due to the fatty contents of the food. While the quantity of fat in the food is often considered, its chemical character is hardly ever inquired into. Butyric, caproic, caprylic, and capric acids are six to eight times as abundant in cow's as in human milk, and butyric acid is the mother substance of the acetone bodies to whose presence a number of infantile disorders are ascribed. The decidedly smaller absorption by the infant of the fat-compound derived from cow's than from human milk, as shown by its presence in the feces, is evidence of the inability of the infantile organism to cope with the fat of cow's milk. As the physical and chemical properties of the milk fat are dependent upon the absolute and relative amounts of lower and higher and uncombined fatty acids, it is evident that mere modification of cow's milk cannot overcome the discrepancy. The volatile fatty acids of cow's milk are irritants of the infantile intestinal mucosa. While digestive disturbances may be arrested by withdrawal of the fats, the infant requires fats for nutrition.

The writer considers yolk-fat the ideal form for infants with chronic gastrointestinal disturbance and latent or even pronounced athrepsia infantum. Yolks of eggs should not be used in infants who thrive on mother's or modified cow's milk, but only in those pathologic conditions which may lead to marasmus or in those due to or aggravated by the fat in the milk. If used, the yolk-fat must entirely replace the milk-fat, and the amount must conform to the caloric and nutritive demands of the organism.

New Method of Preserving Milk.—L. Spolverini and M. Flamini (*Rivista di Clin. Ped.,* July) describe a new method of sterilization of milk, by means of high pressure of carbonic acid gas. The application of this method of preservation is simple in practice. Its results are excellent and aid in solving the problem of feeding infants with uncooked milk. The sterilization by heat destroys the biochemical materials natural to the milk, the ferments. The use of carbonic acid gas does not change the ferments, nor does it make any change in the chemical or physical characters of the milk. It may be kept uncooked for eight to twelve days at a temperature of 12° to 14°, while boiled milk may be kept indefinitely. The bacteria are some of them destroyed, as the blastomycetes, bacillus subtilis, bacillus radiciforme, bacillus of diphtheria; others have their action inhibited, as bacillus coli, bacillus of typhoid, staphylococcus proteus; only one form remains unaffected, a diplostreptococcus, which after some days, with a sufficient temperature, coagulates the milk. This organism is non-pathogenic.

Pasteurized and Clean Milk.—M. E. Pennington and J. A. McClintock (*Amer. Jour. Med. Sci.,* July) give the results obtained in a number of examinations of specimens of "certified milk" and of commercial pasteurized milk in Philadelphia. During May and June, 1904, counts of clean ("certified") milk and of commercial pasteurized milk showed that the latter was richer in organisms on the initial examination and that a rapid increase in the organisms present took place on keeping even at refrigerator temperatures. Pasteurized modified milk, for infant feeding, showed frequently an appalling initial count, and almost invariably a very high count at the end of twenty-four hours. The commercial pasteurizing plants succeed in reducing the original bacterial content of the milk to a very low figure in the heating coils, but again contaminate it in the cooling and bottling of the milk, so that sometimes the final count is higher than that of the original unpasteurized milk.

Premature Infants.—D. H. Sherman (*N. Y. Med. Jour. and Phila. Med. Jour.,* Aug. 5) presents a report of the treatment of these cases at the Children's Hospital, Buffalo. Of the ten babies having a rectal temperature of 96° or less, all but two died. This emphasizes the necessity of careful attention to maintain the temperature immediately after birth. The hospital has prepared a large basket lined with hot water bottles and properly padded, which they send, if notified, to almost any address in the city. They ask only that there be at the home a generous supply

of hot water with which to fill the bottles. Immediately upon admission, the rectal temperature is taken, and if found to be very low, and especially if cyanosis is present, the children are put into a warm mustard bath, with the least amount of handling possible and the gentlest artificial respiration, and allowed to remain there until the temperature is 99°. They are then treated as those entering with normal temperatures. Their eyes are quickly washed with warm boric acid solution. They are cleansed only as much as is essential, are anointed to prevent chilling, are dressed in loose, soft garments wrapped around them, and put into the incubator at a temperature of 95° with proper humidity. As they can tolerate it, the temperature of the incubator is lowered to 90°, where it remains till the child is showing steady improvement and a gain in weight. The writer gives no initial dose of castor oil, possibly a little water; and almost immediately commences feeding with breast milk, diluted with an equal amount of water, to which has been sometimes added one or two per cent. of sugar of milk. This feeding after the first few hours has produced no gastric or intestinal disturbance. Beginning with two to four c.c. every hour during the day and every two at night for two to six weeks, the amount is increased as feasible to sixteen c.c. If too weak to suckle, the infants are fed through the nose. The writer finds that the age of the wet-nurse's baby, as compared with that of the other child using her milk, can usually be disregarded; but it is not wise to give a premature infant milk from a breast which has not been secreting milk for seven to ten days, as it contains too much colostrum. Beef juice, 5 to 10 drops, is added to the feeding. The air for the incubator is taken from out of doors and passes through a thin cotton filter. The child's position is changed frequently to prevent hypostatic congestion and head deformities. The writer's statistics show: Saved at 6 months, none; at 6½ months, 75 per cent.; at 7 months, 50 per cent.; at 7½ months, 66 per cent.; at 8½ months, 100 per cent. Percentage saved according to weight: Under 2 pounds, none; 2-2½ pounds, 25 per cent.; 2½-3 pounds, 50 per cent.; 3-3½ pounds, 42.8 per cent.; 3½-4 pounds, 50 per cent.; 4-4½ pounds, 75 per cent.

The Genital Crisis in the New-Born.—R. Romme (*La Presse Medicale*, July 19) describes phenomena in the new-born that indicate the presence of a crisis similar to that of puberty, during the first week of life. There are two theories as to the production of this crisis: that of Jacquet is that it is simply the close of the development of the genital organs, which has been going on since the fourth month; Helban believes that it is the result of the internal secretion of the placenta, which has been acting on the fetus in the womb, and ceasing at birth ends in a process of involution. The first of the phenomena to be mentioned is the occurrence in 35 per cent. of all girls, about the sixth day, of a slight vaginal hemorrhage, similar to that of menstruation. It amounts to a few drops of blood, in most cases, while if the secretions of all girl babies are examined at that time red blood corpuscles will

be found, even when there is no hemorrhage. The duration is 36-40 hours. It is the result of modifications going on in the uterus, which diminishes in size during the first weeks of life. There are marked congestion of the uterus and sub-epithelial hemorrhages. According to some authors, there is congestion of the ovaries, and Graafian follicles may be found. A similar congestion is found in the testicles and the prostate, accompanied by increase in volume, the epithelial cells being found filling the secretory canals. Hydrocele is common early; that is soon absorbed. On the sixth to the eighth day both sexes have swelling and congestion of the mammæ, with secretion of a creamy fluid; this occurs in 41 per cent. of all children, and is due to proliferation of the glandular elements, and their transformation into a milky fluid. Involution goes on until they reach their natural size. The vernix caseosa, miliary seborrhea and fetal acne are all a part of this crisis.

Congenital Laryngismus Stridulus.—O. Cozzolino (*Rivista di Clin. Ped.*, July, describes a form of laryngismus stridulus that is of congenital origin, the opening of the larynx being badly formed, including epiglottis, aryepiglottic folds and rima glottidis. There is a nervous element also in such cases. It is rarely fatal; when it is so, death is due to bronchopulmonitis or pneumonia, to which the child is predisposed by the malformation of the larynx. It is to be distinguished from a form that has very similar manifestations, but that is secondary to other nasal, pharyngeal, and bronchial conditions of hypertrophy or inflammation. The characteristics of the secondary spasm are its coming in attacks, and its rapid disappearance under treatment for the primary condition. The stridor is different in sound; it is accompanied by less cyanosis and by sinking in of the thorax in inspiration.

Relation of Tetany to Gastrectasis.—James Burnet (*Brit. Jour. Children's Diseases*, May) calls attention to the frequent association of dilatation of the stomach with tetany. He says that it is possible that fermentation in such a stomach gives rise to toxic substances which affect the body in general and not improbably the nervous system in particular. He urges examination for gastrectasis in all cases of tetany.

Etiology and Pathogenesis of Acute Pemphigus in Babies.—Olympio Cozzolino (*Rivista di Clin. Ped.*, July) tells us that acute pemphigus is frequent among young babies because so many are born in institutions where it is prevalent. When they are removed to their homes they do not come in contact with children affected with it, and hence it is rare after the first weeks of life. However it is found in older children and among the relatives, adults as well as children, of the babies affected. The skin of the adult is much less susceptible to the contagion, and it is never found as a diffused eruption, but in patches, especially about the breasts and axillæ of the mother, where the child puts his hands in nursing. It is said to be frequent in the diffuse form in the tropics. In two cases, brothers, one of whom was inected from the other,

and who had a febrile movement with the eruption, the author made bacteriological examinations of the blood, but these were negative. He then made cultures from the blood and obtained two colonies, which were pure cultures of the staphylococcus pyogenes aureus. He then tested the agglutinating power of the blood, and found it present up to 1-100 dilution in one case, and 1-40 in the other. He concludes that this is an acute febrile disease, general and not simply local in the skin; that it is communicable to others and inoculable at all ages. The lesions are not found in the soles of the feet in syphilis alone, as has been stated. The cause is the staphylococcus pyogenes aureus.

Etiology and Classification of Summer Diarrheas in Infancy.— As the result of a study of six hundred and twenty out-patient cases, C. H. Dunn (*Arch. of Ped.*, June) believes that the diarrheal diseases of infancy occurring in the summer months differ neither clinically nor anatomically from the diarrheal diseases of the cooler months, except in their much greater frequency. Owing to the variety of lesions found in cases of similar etiology and clinical course, and to the lack of corespondence between anatomical and clinical pictures, classification on an anatomical basis is not convenient for etiologic study. The writer suggests the following clinical classification for temporary use until the subject is fully investigated: (*a*) Acute Nervous Diarrhea, characterized by loose stools of normal color and odor, without abnormal constituents. (*b*) Irritative Diarrhea, acute intestinal indigestion of the irritative type, characterized by the absence of persistent fever, and by the presence of curds and undigested masses in the discharges. (*c*) Fermental Diarrhea, acute intestinal indigestion of the fermental type, characterized by the presence of fever, and by green stools of a foul or sour odor. (*d*) Infectious diarrhea, characterized by the existence and persistence of fever, and by the tendency toward early signs of ileocolitis, as shown by the presence of blood and excess of mucus in the discharges. When the bacillus dysenteriæ proves to be the cause the case may be further particularized by the term infantile dysentery. (*e*) Rare cases, corresponding to the known description of heat exhaustion and cholera infantum. Of the above types, the indigestion, including the irritative and fermental cases, is by far the most common. The chief or primary cause of all these types is the increased heat of summer, which probably acts in the non-infectious cases by producing functional disturbance either of the nervous system or of the digestion, and in the infectious cases by producing in the intestine conditions more favorable to the occurrence of infection. Bacteria are the secondary cause of a certain number of cases, these being mainly or wholly of the type classified as infectious. Infection may occur by the introduction of bacteria from without, but probably usually by autoinfection with bacteria already in the intestine. The bacillus dysenteriæ is a cause of most of the infectious cases. It can often be found in the intestine in cases where it probably has no causal relation to the

pathologic process, these cases being usually clinically of the non-infectious type. Other organisms are probably a cause of some infectious cases. The anatomical changes of various kinds included under the term ileocolitis may occur in any of the above clinical types except the acute nervous. Anatomical changes of some kind probably occur in all infections cases.

Prevention and Treatment of Summer Diarrhea.—T. S. Southworth (*Med. Rec.*, July 29) strongly urges breast-feeding whenever it is possible. Even partial breast-feeding furnishes an important measure of protection to the child. The practitioner who has not made use of concentrated cornmeal gruel for the nursing mother does not realize what can be accomplished with a deficient mammary secretion. The physician's duty is to seek out and correct errors in nutrition, to combat popular misapprehensions, to further the use of "certified" milk, to warn mothers that at the very beginning of loose movements in summer they should stop the use of cow's milk in any form, clear out the bowels with castor oil, give water or cereal gruels only, and send promptly for the physician, since delay is so often fatal. Cow's milk is not the only carrier of germs into the infant's intestinal tract. The writer refuses to begin or continue the management of any infants unless they give up the sucking nipple, that fraud upon infant credulity, that almost constant appurtenance of the fretful marasmic child, moistened in the bacteria-laden mouth of the attendant to render it more acceptable, dangling against dirty clothes from a dirty string, or reposing temporarily upon dusty shelves and tables, carried in dirty pockets, rolling upon filthy floors and sidewalks and then wiped, perfunctorily if at all, before being reinserted in the mouth of the infant.

C. G. Kerley (*Med. Rec.*, July 22) recommends the usual treatment of beginning intestinal derangement in infants: Castor oil; stop milk and give barley-water or rice water until seen by a physician. Then keep quiet in a cool room; boiled water to drink; frequent spongings on very hot days. The cereal water is continued until acute symptoms subside; then skimmed milk in small quantities is added to it, the milk strength being gradually increased. If skimmed milk is not tolerated, the writer sometimes substitutes diluted condensed milk temporarily. Of the medicinal treatment he says that there are just four drugs which may be relied upon in diarrhea: Calomel, castor oil, bismuth, and opium. Castor oil is used at the outset unless it is not retained, when calomel gr. 1-20 to 1-10 is given instead, at one-half to one hour intervals until one grain has been taken. Bismuth subnitrate must be given in not less than ten-grain doses every two hours, and is not effective unless black stools are produced. If this does not occur, give one grain of precipitated sulphur with each dose. When the child is ready for milk reduce the dosage of bismuth one half and continue until full milk feeding is resumed or constipation occurs. Opium is employed when there is tenesmus with frequent, large, watery stools, never when there are four or five

of medium size in twenty-four hours. When the stools reach this number it should be discontinued. It is given as Dover's powder gr. ¼ to ½ every two or three hours for a child one year of age.

J. A. Coutts (*Lancet,* July 29) employs practically the same measures, but when the stools are very fetid he gives a mixture containing one minim each of glycerin, carbolic acid, and tincture of iodine. For the usual run of cases he employs a half grain each of gray powder and Dover's powder every four hours. If diarrhea persists after the acute stage he prescribes oxide of zinc, which he finds as effective as the usual astringents. In resuming milk-feeding he employs sterilized or pasteurized milk, or an unsweetened condensed milk temporarily.

Joseph E. Winters (*Med. News,* July 15) gives castor oil and only water for at least twenty-four hours after its detergent action has ended. For infants the water is best given hot and from a bottle; if preferred, as by some infants and older children, cold is employed. To give barley-water and dextrinized cereal to a young infant in health or disease is considered by the writer an incomprehensible blunder, a contravention of physiology. Milk, with the proteid content minimized temporarily, is, he thinks, the only sure and safe resource in a child under one year. Detailed directions for such feeding are given by the writer for children of three, six, and nine months, the strength of the milk being gradually increased. A child during the second year requires higher proteid, which cannot be obtained in milk, so use of vegetable proteid is imperative. Beef juice must be eschewed. The writer details the administration of vegetable proteids to children of this age. In neglected and mismanaged cases from three to ten months of age which have become chronic, one of two things only will save life, breast milk or condensed milk. With the advent of autumn weather the writer tapers off the latter, substituting modified fresh milk. Subacute and chronic diarrhea in the second year yield rapidly to exclusive cereal diet; in a bottle-fed child barley gruel, four to six ounces every four hours; if spoon-fed, serve cereals hot with butter and salt at the same intervals. Cold, unboiled water is allowed freely. Irrigation is considered by the writer to be an abused, overwrought treatment, which may be advisable on the first day to supplement the action of castor oil.

Cerebrospinal Meningitis.—A. Seibert (*Med. Rec.,* June 17) records five recoveries, with or without sequelæ, in cases of cerebrospinal meningitis treated by rectal administration of sodium salicylate. The patients varied in age from 22 months to 10 years, and in all the dosage of fifteen grains every three or six hours was employed. Nine other cases seen by the writer are not counted, on the ground that they were more or less moribund.

Epidemic Cerebrospinal Meningitis.—From September, 1904, to April 7, 1905, fifty-two cases of this disease, with seventeen deaths, occurred in Philadelphia. A. C. Abbott (*Univ. Penn. Med. Bull.,* May) says that in only four instances did two cases develop in

the same house, and in two of these they began simultaneously. The other two were the only possible instances of direct transmission from person to person. The disease is, however, legally considered, in Philadelphia, as contagious, and the cases are isolated.

Rheumatism of Childhood.—Speaking of the frequent absence in children of the symptoms typical of articular rheumatism in the adult, W. C. Hastings (*Northwest Med.*, June) says, "let us remember that always, when a child has growing pains, tonsilitis, anemia and functional nervous disorders, we have a case of rheumatism and that the heart is in danger."

Appearance of Streptococci in Variola and Varicella a Means of Differential Diagnosis.—H. De Waele and E. Sugg (*Münch. Med. Woch.*, June 20) have made observations that show the presence in the blood of all patients with smallpox of a streptococcus, which will not agglutinate with the serum of new-born children, or unvaccinated persons, or calves, but does agglutinate with serum of vaccinated persons or calves, as well as with the serum of smallpox patients. This serum contains a streptococcus that is specific for variola patients. In vaccine is to be found a streptococcus which has the same property. A streptococcus was also found in the vesicles of varicella, which varies in agglutinative properties from that of variola. These properties may, the authors think, be of use in making the diagnosis between variola and varicella in epidemics so mild as to render the diagnosis by symptoms doubtful. They give examples where this has been done successfully.

Varicella Gangrænosa.—C. F. Kieffer (*N. Y. Med. Jour. and Phila. Med. Jour.*, July 1) reports a case occurring in a child of 16 months who had previously been in good health. Only a small proportion of the pocks became gangrenous. Only one penetrated deeply, this one, a large lesion near the ensiform, perforating at least two of the muscular layers of the abdominal wall. The slough in the floor of the large ulcer closely resembled in appearance the exudate covering surface wounds infected with the diphtheria bacillus. There was a child convalescent from diphtheria in the same room. Bacteriological examination, however, failed to show the presence of this organism and demonstrated only the streptococcus pyogenes and the staphylococcus pyogenes aureus. Gangrenous varicella usually develops in the presence of marked physical deterioration, most often from tuberculosis, inherited syphilis, and rickets. To clearly systemic infections belong the cases in which cutaneous gangrene occurs independently of the varicella vesicles, and some of those in which the pocks themselves become gangrenous. The larger proportion are due to local secondary infection usually with the ordinary pyogenic organisms, with the bacillus of diphtheria.

Diagnosis of Lobar Pneumonia in the Child.—M. G. Variot (*Gazette des Hôpitaux*, July 20) affirms that the classical symtoms of lobar pneumonia as they are seen in the adult are absent

in the child. There is a marked rise of temperature, but it has oscillations and remissions. Cough does not appear until after several days, when resolution occurs. Dyspnea and accelerated respiration are not at all marked. Sputum is swallowed, and when obtained contains no blood. Hyperthermia, accompanied in older chilldren with pain in the abdomen, is the most marked symptom. Defervescence takes place on the fifth to the seventh day. The physical signs are not marked; there is tympanites on the unaffected side, and slight dullness below the clavicle of the side involved; there are later bronchophony and crepitant râles. The disease resembles closely, when the infant shows nervous symptoms, either typhoid or cerebrospinal meningitis. From bronchopneumonia it is easily diagnosed, because in the latter the respiration is much more rapid, cyanosis is more marked, physical signs are bilateral, percussion gives greater difference between the sides, auscultation gives fine, moist râles, with or without sibilant râles. The X-ray in some cases, when the patch of hepatization is large enough, gives a very good shadow over the consolidated area. The nervousness and irritability of the child render the examination difficult.

Antitussin in Whooping-cough.—Richard Rahner (*Münch. Med. Woch.*, June 20) has made use of antitussin in the treatment of two hundred cases of whooping-cough, and gives us his experience. Antitussin is a mixture of 10 parts of vaseline, 85 of mutton tallow, and 5 of difluordiphenyl. It is rubbed in over the throat and chest of the patient. The one hundred and eighty successful cases all reacted to the medication in a characteristic manner. They began to improve after five days of treatment, the number and severity of the attacks of convulsive cough decreasing, and ceasing after about two weeks of treatment. The marked cyanosis, loss of breath and danger of suffocation were lessened after the second application. The catarrhal symptoms were also improved rapidly. The author believes that the spasmodic stage was prevented in some early cases treated with this ointment, which showed all the early catarrhal symptoms of whooping-cough. In the twenty unsuccessful cases there were rachitis, bronchopneumonia and other severe complications, combined with neglect of treatment until late in the disease. The drug acts both by lessening the irritability of the cough centers and by decreasing the catarrh. In comparison it has a much better and more rapid action than all other methods of treatment. The drug prevents the extension of the disease into the deeper portion of the respiratory apparatus and has no bad effects. An important advantage is that the parents like this method of treatment.

Antibacterial Serum in the Treatment of Diphtheria.—Luigi Concetti (*Rivista di Clin. Ped.*, June) draws attention to the fact that there is still a considerable death rate in diphtheria, in spite of the use of antitoxin, and the immunization of those who come in contact with cases of the disease. Aside from mixed infections,

and infections so severe that they overcome the vital forces before antitoxin has had time to act, there is a factor in the causation of this death rate that is not affected by an antitoxic serum; it is the presence in the system of the bacteria, dead or living, which are not themselves affected by an antitoxic serum. They remain in the false membrane and in the organs, and may be reabsorbed by the patient or conveyed to another throat. Bandi and Wassermann have both, by different methods, produced a serum that is at once antitoxic and antibacterial. This may be used for injection, or locally, by painting it on the throat, conjunctiva or other tissues affected, or it may be penciled on the throat or nares as a prophylactic measure in cases of exposure to diphtheria. The effects of this bivalent serum are much more marked than those of the simple antitoxic serum, and much better results have been gained by its use.

Clinical Experience with Bivalent Antidiphtheritic Serum of Sclavo-Bandi.—Maurizio Pincherle (*Rivista di Clin. Ped.*, June) has made use of the antibacterial and antitoxic serum of Sclavo-Bandi in the treatment of fifty-three cases of diphtheria. These cases were of all types, the slight and benign, the stenotic, and the severe and complicated infections. He has found it of the greatest value, and has obtained better results than with the use of simple antitoxic serum. Two kinds of serum are on the market, one for use by injection, and another which is rendered more active by the presence of very energetic antiseptic substances, and is to be used locally by painting it on the affected surfaces. Pastilles are also made which may be dissolved in the mouth and thus act on the throat. He concludes that this form of treatment has a rapid therapeutic effect in anginal and croupous cases, when there is not a lack of organic resistance in the patient. It is a useful adjuvant to antitoxic treatment, even when there is severe intoxication. The serum locally applied seems destined to be of the greatest use, since it is both curative and preventive, and may thus assist in preventing the diffusion of the disease from infected persons.

Surgical Treatment of Tubercular Cervical Lymph Nodes.—Charles N. Dowd (*Ann. Surg.*, July) submits a study of one hundred such cases which he has operated upon in St. Mary's Free Hospital for Children, General Memorial Hospital, and private practice. He says that tuberculosis of the cervical lymph nodes is apparently due to infection from the fauces, pharynx, or nasal mucous membrane, in the great majority of cases (86 per cent. in this series). Statistics indicate that extension to the lungs and other internal organs occurs in one-quarter to one-half of the cases from whom the nodes are not removed. Thorough removal of the diseased nodes by operation has given better results than any other method of treatment which the writer finds recorded. The records of operations justify the following assurances: (*a*) In favorable cases: Safety of operation (many operators reporting more than one hundred cases without mortality);

a scar which is hardly to be seen; probable confinement to bed of two or three days; the wearing of a bandage or dressing from one and a half to three weeks; freedom from recurrence in about 75 per cent., and ultimate recovery in about 90 per cent. of the cases. (*b*) In the less favorable cases: Safety of operation; less disfigurement from scars than discharging sinuses will cause; freedom from recurrence in 50 to 55 per cent., and ultimate cure in 70 to 75 per cent. of the cases. Transverse incisions, in the neck-creases or parallel to them, are usually to be used. They should be so placed that the fibers of the facial nerve will not be cut. A vertical incision back of the hair line is occasionally helpful. Extensive incisions are necessary for the far advanced cases. Every precaution should be taken to preserve the normal structures of the neck. It is not feasible to divide the cases into groups, some suitable, others unsuitable for operation. Every case with tubercular cervical lymph nodes should be operated upon unless there is a particular reason to believe that the operation would not be endured.

Infantile Tuberculosis.—R. G. Freeman (*Med. News,* May 27) says that tuberculosis in infancy arises most often from an infection through either the respiratory or alimentary tract; the comparative frequency of these two modes of infection has not yet been definitely determined. The tuberculosis of early life is most common during the first year, when children are on an exclusive milk diet, and much milk contains tubercle bacilli, and bovine tubercle bacilli are pathogenic for man. At this period, owing to the structure of the intestinal wall, bacteria can probably pass through it, although it is uninjured. Experiments on animals show that inhalation tuberculosis causes usually lesions of the bronchical, lymph nodes and lungs alone, while these structures are very early involved, whatever the portal of entry. Inoculation experiments prove that the mesenteric lymph nodes may be tuberculous without the presence of any gross lesions in them. Twenty-six and one-half per cent. of the one hundred and fifty-eight autopsies on tuberculous cases at the Foundling and Nursery and Child's hospitals, by the writer, show intestinal or mesenteric lesions on gross examination. The tuberculosis of infancy, unlike that of later life, is usually an acute, widely-disseminated, general disease, with moderate temperature and few symptoms and physical signs unless the invasion of the meninges gives rise to symptoms. Tuberculosis of the cervical lymph nodes and of the joints is rarely seen before the third year. The author believes that while the autopsies tabulated show a very wide distribution of the tuberculous disease in these infants, they probably indicate a much less general distribution than really existed, for the data are based often on hurried gross examination without microscopical confirmation. A series of autopsies in the same institutions, in which the intestines were carefully examined without being separated from the mysentery, and with miscropical examination of all suspicious thickenings, would probably show a much

larger proportion of intestinal involvement and a still greater proportion could be found by animal inoculations.

Tuberculosis in Large Families.—To test Brehmer's theory that in large families the later children are more likely than the first-born to become tuberculous, H. L. Shively (*N. Y. Med. Jour. and Phila. Med. Jour.*, July 8) has tabulated 1175 cases. These were all members of families of from eight to thirteen children. Of these cases it is shown that the larger number were among the earlier rather than the later born members of their respective families. The writer's results cannot, however, be accepted as conclusive, as he takes into consideration apparently only the members of each family which were actually seen. To be conclusive it would, for example, be necessary to know that in a family in which the patient in question was the sixth and last child, the other five were or were not tuberculous.

Symptomatology of Acute Otitis Media in Children.—C. G. Kerley (*N. Y. Med. Jour. and Phila. Med. Jour.*, July 8) writes that in 72 cases he found only one symptom constantly present, fever. Absence of pain or tenderness was noted in 50, or 69 per cent., of the cases, and this in spite of the fact that among those classed as having pain were included those who were very restless, who slept poorly, or evidenced any great discomfort.

Treatment of Acute Otitis Media in Childhood.—The treatment of this affection is summed up by P. Fridenberg (*Amer. Jour. Surg.*, May) as follows: Rest in bed; good nursing, mild catharsis; nasal sprays; free paracentesis under surgical cleanliness, and general anesthesia, as soon as the diagnosis of an active inflammatory process in the tympanic cavity is reasonably sure. Frequent and copious irrigation with hot antiseptic solutions. Mechanical cleansing of the canal and inspection of the fundus of both ears, daily, until the temperature remains normal, and at intervals of two or three days thereafter, until all discharge has ceased. Evacuation of the middle ear by aspiration immediately after paracentesis, and in case of retention due to thickened secretion or a tendency to closure of the paracentesis wound. Abortive measures, particularly leeching and the use of the ice-coil, are to be recommended only at the very beginning of mastoid involvement, and then for not more than a day or two. Drugs for the relief of pain should be used only in cases of unusual urgency, and then only with great care. Repeated administration of narcotics cannot be too strongly condemned. In case of progressive involvement of the mastoid prompt surgical intervention is indicated.

Puberty and Adolescence in Relation to the Etiology of Epilepsy.—W. P. Spratling (*N. Y. Med. Jour. and Phila. Med. Jour.*, May 20) says that epilepsy that commences under ten years is apt to be associated with elements of bad heredity, or to follow a cerebral palsy or one of the infectious fevers. Cures are most often obtained in cases that originate between 10 and 20 years of age. He believes, from a study of the inmates of the Craig

Colony, that in many cases of epilepsy that appear during the twelfth to the sixteenth and eighteenth years, coincident with the establishment of the menstrual flow in women, and with the passing of boyhood into manhood, we must ascribe to these changes the power of inducing well defined convulsions that may be epileptic. Except in the most exceptional instances, these periods alone have no power to induce epilepsy or even epileptoid phenomena in normal individuals. By searching carefully one finds in most cases of epilepsy at this period, either a previous history of convulsions, usually in infancy, or a family and personal history so tainted with a tendency to disease that epilepsy is plainly invited under the stress of puberty.

Treatment of Epilepsy.—Frederick Peterson (*Amer. Med.*, June 24) makes a strong protest against the injudicious employment of bromides in epilepsy. Bromism is worse than the disease. Very small doses should be used. Mild stomachics and laxatives are better than bromides in excess. Proper diet and active outdoor life will bring about 50 per cent. amelioration of the disease.

Mongolian Imbecility.—H. M. Stewart (*Brit. Jour. Children's Dis.*, July) reports two cases. They show the characteristic facies—the sloping of the palpebral fissures downward and inward as in the Mongolian races, with chubbiness of face and a snub nose with depressed bridge—squint, and a shortening of the anteroposterior diameter of the head so that it is nearly flat posteriorly and its circumference diminished. The hands are short and the fingers tapering, and rounded at the tip, not broad as in cretins. The circulation is weak. The snuffling, which is common in these cases, and the depressed nasal bridge, suggest syphilis, but other signs of that disease are absent. Dentition is late and often irregular. The child of 13 months has one tooth, that of 19 months has only two, both molars. The older child sat up at eight months and now can stand with the aid of a chair; the younger makes no attempt even to roll over, but will remain sitting if so placed. The elder showed signs of talking at one year, but now says only "dada"; the younger makes similar sounds. The children are apathetic or vivacious, generally good tempered, and can distinguish their parents. The higher grades can be taught to be cleanly quite early. These children are usually born toward the end of the reproductive period, often being the latest in large families. Probably any cause which exhausts either parent, such as alcoholism, syphilis and insane heredity, may lead to Mongolian offspring. These children are liable to congenital cardiac disease, to respiratory affections and to epilepsy. While they can be trained considerably, and the higher grades develop fair imitative capacity, their reasoning powers always remain below normal. No drug is known to affect the condition.

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ORIGINAL COMMUNICATIONS.

A STUDY OF THE ETIOLOGY OF FLOATING KIDNEY WITH SUGGESTIONS CHANGING THE OPERATIVE TECHNIQUE OF NEPHROPEXY.*

BY

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Detroit, Michigan.

(With one illustration and plate.)

One year ago this association honored me with an election to its presidency. For this distinguishing mark of your favor I thank you most heartily, and for the goodwill and friendship which prompted your action I am equally grateful and duly appreciative.

Fourteen years ago we met in this city for our third annual meeting. Our history had then but just begun to be written. To-day we find that these years each have been an upward step in advancement and development. The virile spirit, the unrest of investigation and conquest, are still our dominating characteristics. The character of our work during these years, as shown by the transactions, attests this fact. Beside the building up and developing of itself, the American Association of

*The President's Address before the Annual Meeting of the American Association of Obstetricians and Gynecologists, held in New York, Sept. 19, 20 and 21, 1905.

Obstetricians and Gynecologists has also been influential in revivifying, rejuvenating as it were, an aged sister society by giving to her of its plethora and abundance. While this much-needed Samaritan-like work was not entirely voluntary on our part, and to see the siren beckoning, and the succumbing now and then of a member to her wiles, has not been altogether pleasant, yet the thought "the greatest good to the greatest number" should animate us, and when we consider that, whereas we started to build up but one society, we have really built up two—doubled the membership of the aged one, and kept our own ranks full, each member of which belongs to the "quick" and not the "dead", we may certainly look back upon these years with great pride, and look forward with great hope and confidence to the future of our association.

In looking the ground over for material for a presidential address the dearth of new, unused, spick and span subjects was at first interesting and amusing to me; but as time passed the question became more serious, if not alarming, until the thought came to me that my audience had listened to many histories of various kinds by orators with whom I could not hope to compete, and also had had much advice as to their future course in life by men whose opinions would be more likely to sway them than my feeble words. I therefore decided to tell you in an unconventional way a simple story of an endeavor, hoping that its rehearsal would interest you in the same degree as its pursuit has its author, and chose for my subject

A STUDY OF THE ETIOLOGY OF FLOATING KIDNEY, WITH SUGGESTIONS CHANGING THE OPERATIVE TECHNIQUE OF NEPHROPEXY.

The condition of nephroptosis has been the subject of much thought and speculation for many years, and its etiology widely discussed. The facts that 85 per cent. of all cases occur in women and that fifteen kidneys of the right side to one of the left, become movable, and that the left kidney is almost never singly displaced, and when it does become displaced gives no such serious symptoms as are attributed to the right-sided displacement, form a sort of tough *entrée* beside the equally tough *pièce de resistance*—the fact that the kidney does come down—of the etiologic repast.

The causes of these conditions have never, in the opinion of the writer, been satisfactorily explained in the literature at his command, so that when an incident occurred to draw his attention to this question he followed the lead, so to speak, and now

will attempt to give a preliminary report of his work along the lines mentioned. The report must of necessity be unfinished at this writing, as sufficient time has not yet elapsed to prove certain operative work by the test of permanence; besides, more work on the cadaver is yet desirable to establish, by the proof of greater numbers, the facts already apparently in evidence.

On December 17, 1903, while operating on a young girl of sixteen years of age, for appendiceal disease, at the Solvay Hospital in Delray, the writer accidentally discovered that the kidney, which was normally placed, could be easily pulled down and held in a firm position of complete prolapse, by making traction on the cecum. This led to further observation on the etiology of displaced, loose, or floating kidney, both on the cadaver and the living subject, and afterward, as a result of those observations, to efforts to devise an operation that should have for its object the retention of the kidney in its normal position as well as the anchoring of the ascending colon in such a manner as to remedy the prolapse of the cecum, which usually obtains in these cases, so that it should not exert further traction on the kidney and, through it, on the duodenum and renal vessels. The object of this address is to record the results, though unfinished, of these observations.

The fact that the kidney in question could be pulled down and held firmly in this position by traction on the cecum and ascending colon, was an indication that there exists a more firm and positive attachment of this viscus to the kidney than is generally believed. Gerrish says: "The non-serous areas (of the kidney) are connected with the various organs with which they are related by areolar tissue." This author also says of the supports of the kidneys: "The kidneys are kept in place by their vessels, the peritoneum, and the abundant fatty tissue in which they are embedded." Another (Ref. Handbook of the Med. Sciences) says: "The chief support of the kidney is the fibrous capsule which surrounds the gland as far as the hilus and sends a firm prolongation behind the renal vessels with the sheath of the aorta, and the fascia, which covers the pillar of the diaphragm. The fibrous prolongation acts as a suspensory ligament to maintain the kidney in position."

We are still farther told that "the kidneys are held in place normally by the connections of the peritoneum with the perinephric fat." (Am. Text Book of Surgery.)

A third capsule has been described by Gerota, called the renal

or perirenal fascia, lying outside the fatty capsule. Its anterior layer passes across the front of the kidney and meets the same layer of the opposite kidney. The posterior layer is attached to the periosteum of the vertebræ. This fascia is adherent anteriorly to the peritoneum. This is apparently a continuation of the parietal subperitoneal fascia and should also tend to support the kidney to a limited extent.

Thus, the supports of the kidney are seen to be of a rather uncertain and indefinite character, and yet apparently sufficient to maintain an organ weighing but from four to five ounces (Gerrish). Why this small organ, weighing so little, is pulled or pushed, as the case may be, out of its normal position, and why the right one so much more frequently than the left, are questions that have many and diverse answers by many and diverse authorities. The etiologic factors, as outlined by the many recorded articles on this subject, touch every organ within the abdominal cavity, from the liver and stomach to the uterus, and beyond and outside the abdomen to the perineum, and at last, as though there were no further organs to condemn for the crime of the abduction of their inoffensive, hard working associate, the whole body, or rather its shape, is at last attacked and charged with the offense.

Among these almost numberless opinions which are more or less confusing to the investigator, some are exceedingly ingenious and interesting, if not altogether plausible. A few of them are as follows:

International Text Book of Surgery: Atrophy of adipose capsule; repeated pregnancies; enteroptosis where the displaced intestine makes traction on the kidney; pressure on the waist by corset of skirt band, seldom by traumatism.

Am. Text Book of Surgery: If the perinephric fat is absorbed during acute disease or from long-continued ill health the organ can move more freely, and by its weight elongates the parietal folds which in other cases are abnormally long and lax. The kidney may also be dislocated by trauma Most common in poorly nourished females who have borne children, the scarcity of fat and the relaxation of the abdominal walls following pregnancy act as predisposing causes.

Fecal impaction as a factor in the causation of floating kidney is mentioned by Frank Griffith (*Med. Record*, July 20th, 1901), who reports a case in a woman of 25 in which the long-continued weighing down of the colon with fecal accumulations

was active in the production of the kidney condition, and when it was removed a prompt recovery took place.

As showing the intimate connection between the lower bowel and the kidney, the writer cites a case of loosened right kidney in a young woman who began to suffer from a stubborn colitis which defied treatment until the performance of nephropexy, when almost at once the bowel symptoms disappeared.

Reference Handbook of the Medical Sciences: The kidney is normally held in place by a fascial prolongation from its fibrous capsule to the spinal column, and also, according to Walkoff and Dilitzin, by the shape of the cavity in which the kidney lies. The normal cavity is funnel shaped. In a case of movable kidney the recess is shallow and more cylindrical. Other alleged causes are the reduction of the intraabdominal pressure by relaxation of the abdominal walls; tight lacing, especially if so carried out as to compress the ribs, and muscular strains and blows.

M. L. Harris (*Jour. Am. Med. Assn.*, June 1, 1901) cites the following as the usually accepted causes:

1. Repeated pregnancies.
2. Prolapse of the uterus and vagina with laceration of the perineum.
3. Retrodisplacements of the uterus by drawing on the ureters.
4. The rapid absorption of perineal fat as may occur in wasting disease.
5. Drawing on the kidneys by the transverse mesocolon in enteroptosis or Glenard's disease.
6. The relaxation of the abdominal walls which follows the removal of abdominal tumors or ascitic accumulations.

He shows these etiologic factors to be fallacious, and conclusions are presented as follows:

1. The essential cause of movable kidney lies in a particular body shape.
2. The chief characteristics of the body form a marked contraction of the lower end of the middle zone of the body with an elimination of the capacity of this portion of the body cavity.
3. The diminution of capacity depresses the kidney so that the constricted outlet of the zone comes above the center of the organ and all acts, such as coughing, straining, lifting, flexions of the body, etc., which tend to adduct the lower ribs,

press on the upper pole of the kidney and carry it still further downward.

4. It is the long-continued repetition in a suitable body form, of these influences, which collectively may be called internal trauma, that gradually produces a movable kidney.

In support of the above table he cites a number of cases. By some great stress is laid on the effect of the modern dress as an etiologic factor in the displacement of the kidney in women. Küster does not agree with this, as he finds the Egyptian women, who wear loose clothing, have floating kidneys.

After a consideration of the foregoing literature of the subject, the writer naturally assumed that the kidney of his patient was pulled down by the adhesion of the peritoneal attachment or mesentery, of the colon, to the fatty capsule of the kidney, and yet the firmness of the attachment was an apparent contraindication. With the object of testing this point, three cases of floating kidney were operated upon. The peritoneal cavity was entered through the usual incision in the loin, the redundant mesentery gathered up and attached to the incision of the fascia close to the twelfth rib, at the upper angle of the wound. In the first case, which was an extreme one of ptosis, having had Dietil's crises for several years, the ease with which the operation was performed, the amount of slack mesenteric tissue brought out and attached, and the immediate result which it had of entirely replacing the kidney so it could not be pushed down into the abdomen, was very encouraging.

In the second and third cases, however, in both of which the displacement was less pronounced, there was practically no mesentery, as was present in the first case, so that the peritoneal fixation seemed to promise less. However, while drawing the peritoneal attachment of the bowel out and making efforts to push the bowel down, away from the kidney, it was observed, in both cases, that there was a cord-like structure passing downward from the lower pole of the kidney, which prevented the separation of the kidney and bowel. This was included with the peritoneal tissue and attached with it. Further investigation of the literature failed to enlighten the writer as to the presence of any tendonous prolongation from the lower pole of the kidney, so further investigation was made on the cadaver, the dissection being as follows: The whole upper half of the abdominal parieties being incised and turned downward, the cecum, ascending colon, with hepatic flexure and kidney on the right side, and part of the descending colon with

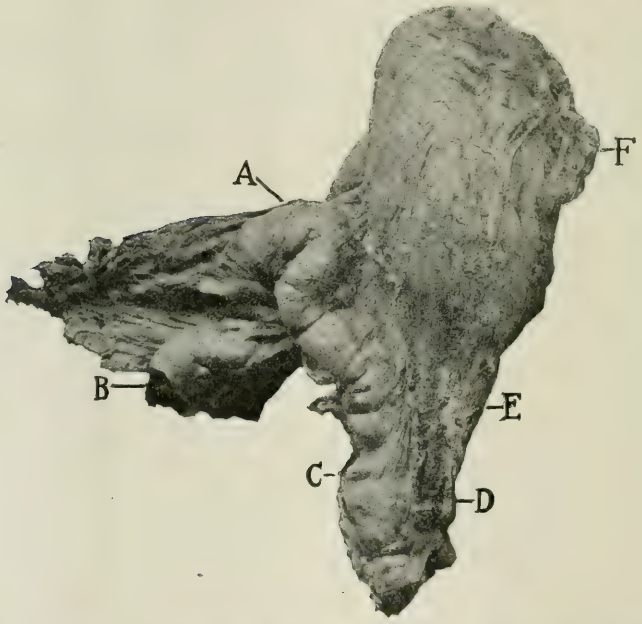
splenic flexure and kidney on the left side, were removed, the dissection being made from below upwards and the organs removed together in such a manner as not to interfere with their normal attachments to each other. On turning the specimens over, the posterior surface of bowel and kidney of each side showed a similar formation of tendonous attachment to each other. This was found to be formed by the gathering together of fine longitudinal fibers from the fibrous network which forms the framework of the fatty capsule. The tendonous ridge, formed by its attachment to the posterior surface of the ascending colon, could be followed easily, between the peritoneal reflections, down to the margin of the lower peritoneal attachment of the bowel, and close to the junction of the ileum—in fact near the point of the so-called origin, in the female subject, of the suspensory ligament of the ovary. This ligamentous continuation of the framework of the fatty capsule is probably the tissue left in the track of the ovary, or testicle, in its descent from its place of origin in the Wolffian body, high up near the kidney. Nagel says: "The *Ligamentum Suspensorium ovarii* springs developmentally from the phrenic ligament of the kidney, being therefore situated on the posterior abdominal wall."

A specimen illustrating the presence of this *phrenocolic* ligament is herewith submitted. So much for its probable cause of origin, which is interesting from an embryologic standpoint and is worthy of further study, but the important point is: How much mischief is this little remnant of embryologic life doing; how much of an etiologic factor is it in the production of displaced kidney? The anatomist tells us that the fatty capsule does not develop till after the tenth year. This is no doubt true as regards the *fat* of the capsule, but it is not true if applied to the fine fibrous network which forms the frame of the so-called fatty capsule, as this is found to be present in the newly born infant, enveloping the kidney and passing downward, its fibers converging at the lower pole into a more or less ligamentous structure which is inserted into the posterior wall of the ascending (or descending) colon, in exactly the same manner and proportion as in the adult. This the writer has also demonstrated on the cadaver.

Specimens illustrating this fact are herewith submitted, one of which, consisting of uterus, Fallopian tube, ovaries, ascending and descending colon and kidneys, connected together by their normal attachments, also shows the apparent continuation of this nephrocolic ligament with the suspensory ligament

of the ovary. In these small subjects the nephrocolic attachment was found much the most pronounced on the right side.

This ligamentous union of the kidney and bowel the writer claims is the most important factor in the etiology of nephroptosis. The full cecum in its efforts to push its contents upwards, is making traction downwards, which pulls the kidney with it by reason of this attachment. The cecum is constantly making counter-extension, as it were, with its fixed point above, while the descending colon makes its counter-extension upward

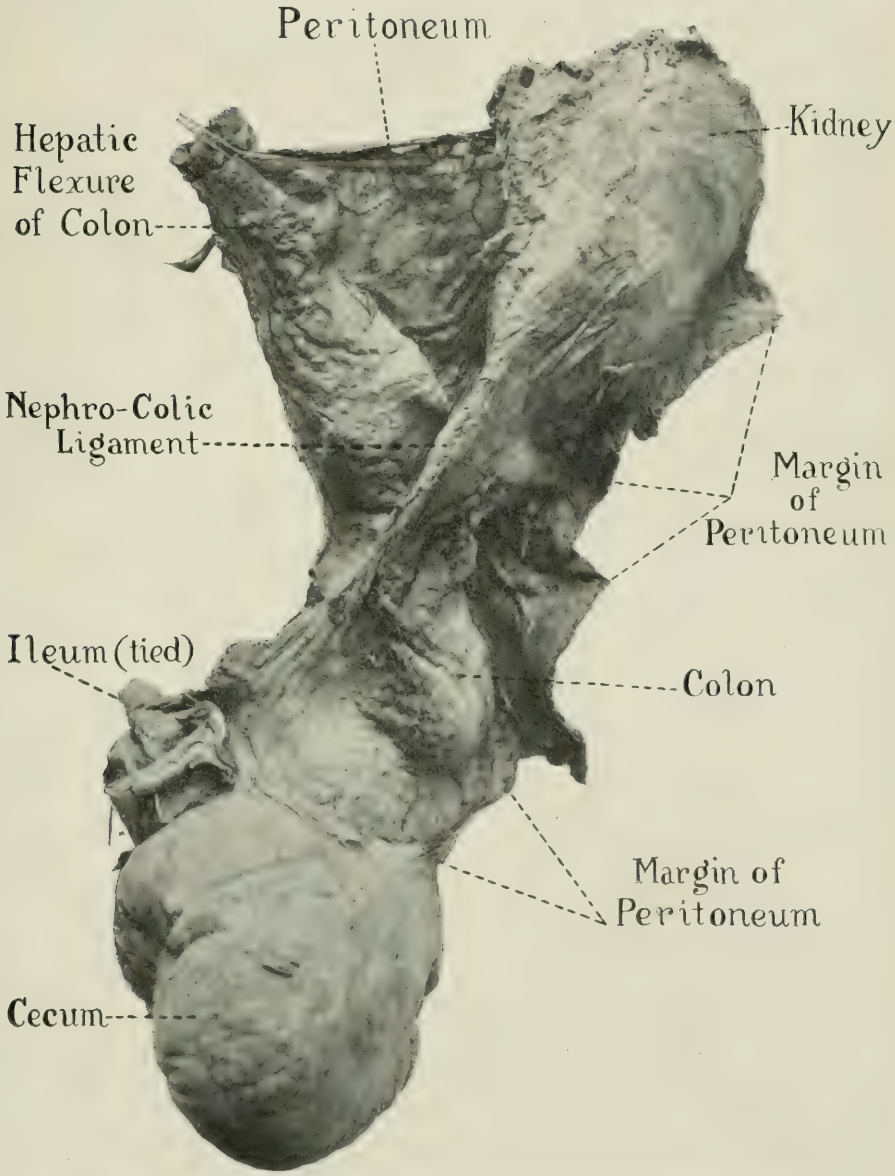


Posterior View of Left Kidney and Colon, Showing Nephrocolic Ligament.

A, splenic flexure of colon.
B, transverse colon (turned back).
C, descending colon.
D, margin of peritoneum.
E, nephrocolic ligament.
F, kidney.

with its fixed point below. This will explain the greater relative frequency of the displacement of the right kidney over the left, which is given as about fifteen to one (*Ref. Handbook Med. Sciences*, p. 357).

So far as the writer knows there has not, heretofore, been given any adequate explanation of the cause of this great difference. The pulling of the right kidney down by this definite and positive form of traction would also account for certain symptoms which so frequently accompany the displaced kid-



Posterior View of Right Kidney, Colon, and Cecum, Showing Nephro-colic Ligament—*Longyear*.

ney and which are of a "digestive" and "nervous" character, and which owe their activity to the fact that the fatty capsule of the kidney is adherent at its inner aspect, to the descending portion of the duodenum. Traction on this viscus by the full cecum pulling downward on the kidney, causes a kinking of the gut with the causation of the symptoms referred to. The cecum being the starting point of the forward movement of the colonic contents, and a *cul-de-sac* from which its contents must invariably go in one direction (and that upward), or impaction result, the consequence is that impaction due to torpidity is frequent, the cecum becomes heavy and pendant, pulling more and more on its attachments by its sheer weight. Add to this nature's violent efforts necessary to force the contents upward, and we have a simple and also an adequate explanation for the displacement of the right kidney as well as the presence of the prolapse of the ascending colon, which is its usual accompaniment. The properly applied abdominal band or truss relieves symptoms attributed to the floating kidney, not because it raises the kidney, but because it raises the cecum and so prevents traction on the renal vessels and duodenum.

A kidney stripped of its fatty capsule and fixed by adhesion to the muscular parietes quite frequently fails to relieve symptoms, because the continuity of attachment between the duodenum and cecum still remains through the fatty capsule, and the action of the prolapsed cecum continues to exert its influence through it on the duodenum and stomach.

If the contention of the writer is correct, that this ligamentous union of kidney and bowel is the principal cause of the pathological condition under question, then surgical therapeutics must be altered in such ways as to meet the demands of those conditions. To strip the kidney and fasten it, only where it will no longer be pulled upon, and leave the cecum to continue its traction on the duodenum, through the fatty capsule, would appear to be incomplete and bungling surgery. Theoretically, from this standpoint, the kidney stripped of its fatty capsule, without permanent elongation of its pedicle, should remain in its normal position, as its very small weight of four or five ounces would not displace it. The retention of the cecum in its normal position and the prevention of its traction on the duodenum should be the prime object of interference in this condition.

The kidney should also be fixed, and, if possible, with its fatty capsule intact, and in such a manner as not to run the risk of adding another pathologic condition (not easily rectified) to

those already existing, as is too frequently the result of the usual operation of nephropexy. The great variety of opinions on this subject, both anatomic and etiologic, is so varied and conflicting and so devoid of that exactness of detail that is so necessary for a proper foundation for effective therapeusis, that it is not surprising that the treatment of the displaced kidney has led to so much controversy, and that its treatment, both surgical and medicinal, has been so unsatisfactory and disappointing. A large proportion of the cases treated by operation are unsuccessful, as judged alone by their failure to relieve symptoms. In many cases the kidney remains fixed, but the symptoms persist with frequently others added to them by reason of a too low placement of the kidney. In others the not over-strong capsule is cut through at the points of suturing as a result of post-operative vomiting, or other early movements of the patient after the operation, and the kidney fails to remain fixed. In the latter case, if the fatty capsule has been well stripped away from the kidney, very little if any relief of symptoms may follow, and yet the kidney, while still palpable and more freely mobile than normally, will be found to go gradually back to its natural position. If the fatty capsule has not been well separated from the fibrous capsule this improvement in the position of the kidney will not take place in such cases, as the strong attachment of the fatty capsule to the ascending colon will pull it down again. For this same reason must the fatty capsule be entirely stripped away from the kidney, when the nephropexy is made in the usual manner by stitching the fibrous capsule to the parietes and not for the usually accepted reason, that the fatty capsule will not unite readily to the tissues against which it is held.

The usual operation of nephropexy is inadequate because it fails to meet all the indications in the conditions present. To be effective the operation must certainly do one thing which the stitching of the stripped kidney only, to the loin, cannot accomplish, namely: the prevention of the descent of the ascending colon and cecum. The operation must have for its aim the attachment of both kidney and bowel; or the nephrocolic attachment may be severed, thus preventing traction on the kidney and duodenum, and the kidney fixed by simply stitching the severed ligament into the wound at its apex. This would seem an ideal method, theoretically, as it would fix the kidney and, by severing its attachment to the bowel, prevent the traction on it and the duodenum. But this the writer has found difficult to do

without danger of wounding the bowel. The operation which he has found the most easy of accomplishment and which seems to meet the two indications mentioned, is the fixation of this nephrocolic ligament into the upper angle of the wound without severing it from the colon, and also fastening the redundant mesentery, if it be present, in the lower angle of the wound. The convergence of the framework of the fatty capsule into this ligament makes a structure of sufficient strength to be depended on to hold the displaced organs if securely attached to the aponeurotic tissue, preferably where it is thick near the twelfth rib.

The kidney fixed by this ligament is placed at nearly its normal position and is not held in an immovable position, as is the case when united to the muscles by the usual operation. The bowel is also held by the same attachment and undue descent of the cecum prevented, and it is possible that this will prove sufficient; but in those comparatively rare cases in which a mesentery is present the writer deems the shortening of a redundancy best, if for no other reason, than that it will prevent traction on the other attachment while it is becoming firmly fixed. As this part of the operation necessitates opening the peritoneal cavity it will be abandoned by the writer if found unnecessary. The opening into the peritoneal cavity has, however, the added important advantage of giving free access to the kidney and enabling the operator to handle the organ at will; through its close attachment to the colon, traction on the latter, brought through the wound, serving to bring the kidney close to the opening. The difficulty of handling the kidney when grasped by the sides of the fatty capsule has been experienced by all, as the tissue gives way readily and appears to have little resisting power. This is because the fine fibers forming the network of this capsule are spread out and the trabeculæ widely separated by the fat deposited between them. As they converge below the lower pole of the kidney to become inserted into the posterior wall of the bowel, they lie parallel to each other and by their aggregation form a strong band of a good deal of resisting power, so that the kidney can be readily held in firm fixation by means of a blunt hook passed around it, permitting complete control of the organ for examination or further operation.

The writer, while submitting the record of these incomplete observations and experiments, recognizes that they are such, but hopes and believes that future work in this field will demonstrate the feasibility of his suggestions. But whether right or

wrong, he believes in the philosophic words of Herbert Spencer —that" Not as adventitious thoughts will the wise man regard the faith that is in him. The higher truth he sees he will fearlessly utter, knowing that let what may come of it he is thus playing his right part in the world—knowing that if he can effect the change he aims at—well: if not—well also; though not so well."

271 Woodward Avenue.

TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

Eighteenth Annual Meeting, Held at the Hotel Astor, New York City, September 19, 20 and 21, 1905.

The Association met at the Hotel Astor, under the presidency of DR. HOWARD W. LONGYEAR, *of Detroit, Mich.*

After an eloquent address of welcome by DR. GEORGE B. FOWLER of New York, which was responded to by DR. CHARLES A. L. REED, the reading of papers was begun.

PYOSALPINX IN PREGNANCY AND CONFINEMENT*

REPORT OF A CASE OF MULTIPLE PREGNANCY AT TERM COMPLICATED BY DOUBLE PYOSALPINX.

BY
O H. ELBRECHT, M D.,
St. Louis, Mo.

THIS case is reported in the interest of obstetrics with the hope that it may add some light to that vague subject of pus tubes as a complication to pregnancy and confinement.

The duty of reporting it was impressed upon me while looking up the literature, for it is scarcer than I thought it was, and I therefore crave your indulgence.

The history of the case in point is as follows:

Mozelle, N. (colored), age 23, single, born in Arkansas, father and mother born in North Carolina, occupation cook, entered the hospital May 14, 1904.

Previous health.—Good. One abortion in the fifth month three years ago. One full term confinement about two years ago; normal; child died when five months of age. Last menstruation, September 20, 1903; quickening February 1, 1904. No circulatory or digestive disturbances and no history of discomfort or pain.

Height 5 feet 7 inches, weight 130 pounds, fairly well nourished, no evidence of rachitis, syphilis, or acute gonorrhea. Temperature, 98 2–5; pulse, 88; respiration, 24 on day of en-

*Read at the Eighteenth Annual Meeting of the American Association of Obstetricians and Gynecologists, at New York, September 19-21, 1905.

trance. Lungs and heart normal with the exception of a slightly accelerated pulse.

Abdomen ovoid and its greatest circumference 33 inches, uterus central, and fundus 4 inches above the umbilicus. The position of the feti were not fully determined for the diagnosis of multiple pregnancy was probable; one head, however, rested on the brim of the pelvis and a fetal pulse could be heard in the left lower quadrant.

Pelvis measurements. — Distance between spines 26 cm.; distance between trochanters 30 cm.; distance between crests 27½ cm.; external conjugate diameter 20 cm.; introitus normal; admitted three fingers; no vaginal discharge; vaginal secretions acid. Cervix large, soft, and closed.

Urinalysis showed nothing abnormal.

Labor pains began June 5th. First stage lasted 16 hours, 50 minutes. Second stage 1 hour, followed by the second child in 17 minutes and third stage immediately followed the delivery of the second child.

The progress of labor was normal and no objective or subjective symptoms were observed.

The first child, a male, 4½ pounds, was born left occipito-anterior, and the second child, a female, 4 pounds 1 ounce, was born abreech. The placentæ and membranes were expelled intact (there being two placentæ); no laceration of perineum, and labor was complete at 11:15 P. M. During this night, or immediately following her labor, patient did not rest very well; expelled a large blood clot and complained of some pain in the lower abdomen.

First day.—Morning temperature 98.6; pulse 78; respiration 24. Evening temperature 101; pulse 80; respiration 22.

Lochia flowed freely; no odor; paroxysmal pain in lower abdomen; uterus tender upon mild pressure.

Second day.—Morning temperature 98.2; pulse 74; respiration 20. Evening temperature 100.6; pulse 86; respiration 24.

Lochia flowed freely; complained of dull pains in lower abdomen; uterus tender; perspired freely during the night and did not rest well.

Third day.—Morning temperature 100; pulse 84; respiration 24. Evening temperature 100.2; pulse 88; respiration 28.

Complained of some abdominal pain. Uterus firm but very tender; free flow of lochia but odor was now offensive. One-half per cent. carbolic vaginal douches were ordered three times

a day. One ounce of castor oil given and two movements of bowels resulted. Slept well.

Fourth day.—Morning temperature 100.4; pulse 110; respiration 18. Evening temperature 102.4; pulse 112; respiration 24.

Uterus large and very tender; lochia scant and offensive; douches continued; seven bowel movements and slept poorly.

Fifth day.—Morning temperature 102; pulse 120; respiration 28. Evening temperature 104.2; pulse 124; respiration 28.

Complained of a great deal of tenderness in lower abdomen; lochia free but still offensive; douches continued; two bowel movements and slept very little; stimulants, whiskey and strychnine.

Sixth day.—Morning temperature 100; pulse 120; respiration 34. Evening temperature 98.6; pulse 140; respiration 40.

Was very restless; complained of severe pain, and abdomen was now slightly distended; lochia scant and very offensive, and patient first commenced to show signs of weakness, for up to this time she seemed strong and did not in any way seem to realize that she was very sick; slight nausea, and vomited twice. Stimulants and douches continued; slept very little, but after ¼ grain morphine and atropine 1–150 were given, rested fairly well in the morning.

A twenty-four hour bouillon culture of the blood taken on the fifth day, which was made by withdrawing a liberal amount of blood from the basilic vein with an antitoxin syringe and planted in a four-ounce Florence flask of nutrient bouillon, proved negative.

Seventh day.—Morning temperature 98.4; pulse 134; respiration 32. Evening temperature 96.6; pulse 140; respiration 30.

Nausea and some hiccoughing, but no vomiting; lochia still very offensive; perspired freely; abdomen distended and very tender all over; increasing weakness and no bowel movements; Whiskey and morphine continued. Patient died at 9 P. M.

While it is very evident that my patient on the afternoon of the sixth day was suffering from a general peritonitis, her condition was still such as to make me feel that celiotomy was not yet justifiable, as a slight distention of the abdomen appeared only on that day as did also the nausea and vomiting, and she only vomited twice during the entire course of her disease.

It was just as evident on the seventh day, by the ratio between the pulse and temperature, that my patient was enter-

ing a state of collapse, and hence celiotomy was not attempted. The course of her disease was very misleading, for she certainly had a puerperal sapremic endometritis, which completely disguised the ruptured pyosalpinx, and hence my attention was not attracted to any intraabdominal complication excepting the pelvic peritonitis, which I naturally considered as being secondary to the intrauterine infection.

Autopsy was performed June 13, 1904, thirteen hours after death, and only those lesions that have any bearing on the case will be mentioned, as the complete report would take up too much time.

When the abdomen was opened it was found filled with purulent fluid, the intestines being matted together by delicate fibrinous adhesions. The omentum extended down to the left side of the pelvis, where it was firmly adherent to the fundus of the uterus and a portion of the left Fallopian tube. Uterus, about the size of a three and a half or four months pregnant uterus, was very soft and flabby; on section showed plainly the two placental sites, and a sapremic infection of the endometrium.

The left Fallopian tube was plainly a pyosalpinx; the greatest diameter corresponding to about the width of two fingers. At its outer third, and including the fimbriated extremity, there was a laceration, or rupture if you choose, about twenty-five millimeters in length which allowed a free flow of the yellow creamy pus contents.

The left ovary was small and not infected, apparently normal.

The right Fallopian tube was also a pyosalpinx, its greatest diameter equaling that of a lemon. The fimbriated extremity was open to such an extent as to allow pus to escape by the mildest kind of pressure.

The right ovary contained a large abscess which was in no way connected with the pus tube.

Gonococci were subsequently demonstrated in pus collected from the tubes by the method of Gram.

Thus, it becomes apparent from this autopsy picture why the patient developed an acute general peritonitis.

The only cases that I could find that are at all analogous are one by Hare[1], whose patient had a tubal pregnancy and double pyosalpinx with very interesting pathology.

The left tube was a well developed pyosalpinx while the right presented a tubal gestation in its fimbriated extremity, with a pocket of pus between the pregnant end and the uterus.

The latter condition, he explains, must have occurred as the

result of a curetment he performed a short time previous to the celiotomy for tubal pregnancy.

Talley[2] also reports a case of double pyosalpinx coexisting with pregnancy operated upon by him in the third month, which presents features that prove conclusively that a unilateral pyosalpinx during pregnancy may develop into a bilateral pyosalpinx, by the escape of infectious pus from the fimbriated end of the affected side to the open fimbriæ of the unaffected side.

The reports of two pathologists in this case who worked independently of each other, both showed that the tube which was secondarily affected was infected by way of the fimbriæ, as its pathology was confined entirely to its outer third: the middle third showing only slight inflammatory changes, and the inner third, including the uterine attachment, was normal.

Blank[3] projects the hypothetical theory that virulent bacteria in the tube have a tendency to become pyosalpinx during pregnancy by reason of the hyperemia. He further states that fifty per cent. of those cases in which the tubes are adherent in the cul-de-sac rupture as pregnancy advances, from tension, pressure, or stretching of the adhesions which forces pus out of their fimbriated extremity.

My own experience with three cases of this class somewhat substantiates Blank's theory.

One case came to the hospital three weeks after confinement with the following history: on the seventh day of puerperium she had a severe chill with a rise in temperature accompanied with profuse perspiration. The chills, perspiration and temperature continued at irregular intervals until the twenty-second day, when she was seized with severe pains in the lower abdomen; vomiting, profuse sweating and a temperature of 102 degrees.

On the twenty-third day she was brought to the hospital with a temperature of 102.6, pulse 126 and respiration 26. Abdomen distended, very tender all over, especially the lower right side. Vaginoabdominal examination revealed a mass in the right tubal region. Celiotomy was performed immediately and disclosed a free seropurulent fluid in the pelvis and beginning general peritonitis. Further examination showed a ruptured abscess in the right ovary and a recent double pyosalpinx, each tube being highly inflamed and about the size of a thumb and containing a small amount of pus. Double sal-

pingo-oophorectomy was done and patient made a splendid recovery.

Another case that was confined at the hospital left feeling entirely well on the twenty-first day and went to a home for convalescent women. On the forty-third day she became suddenly ill with symptoms of irreducible inguinal hernia and was returned on the forty-fourth day feeling weaker than when she left, and suffering from severe pain in the right inguinal and tuboovarian region. Temperature 98.4, pulse 84, respiration 26. Examination revealed an enlarged tube which was very sensitive to pressure and seemed to be adherent to the internal ring. Celiotomy revealed a tuboovarian abscess about the size of an orange, firmly adherent on the right side to the internal ring, and a pyosalpinx on the left. I have reason to believe that they developed since confinement. Patient made a splendid recovery from the operation, herniotomy being performed at the same time.

Another case that was delivered at the hospital and had temperatures for a period of seven weeks varying from 99 to 104 degrees, was operated on the fiftieth day, having been confined to her bed all the time. On opening the abdomen a general plastic peritonitis was found with a large ovarian abscess which had evidently been ruptured for some time, thus accounting for the peritonitis. Death occurred the day following operation.

Conclusions.—The most striking feature of the first case was the obscurity of this fortunately rare complication, for without the autopsy I would certainly have abided by my first and only antemortem diagnosis, *i. e.* sapremia, and would have continued to believe that the general peritonitis was the result of the sapremic infection traveling upward through the tubes and thus into the abdominal cavity, for such a process, to my mind, would be all the more plausible in the large and flabby uterus of multiple pregnancy, more especially from the fact that large blood clots were passed on the first day, showing the relatively imperfect contraction of the uterus.

The case also shows very plainly the ability or the degree of tolerance of the pelvic peritoneum to cope with infections, as it is my opinion that the peritonitis was not general until the sixth day, for up to that time there was no hiccoughing, no vomiting, no abdominal distention and no apparent weakness.

Another deduction is that gonorrheal peritonitis, while not very dangerous if confined to the pelvic peritoneum, is surely

dangerous when it creeps out of the pelvis and becomes diffuse.

It is also my firm belief that the pyosalpinx in this case was unilateral at the time of impregnation, and that the infection was transmitted by the escape of virulent pus into the open fimbriæ of the unaffected side.

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2. Talley, Frank W., of Philadelphia: *American Gynecological and Obstetrical Journal*, November, 1900; page 426.

3. Blank, Paris, France: *Annals de Gynecologie et d'Obstetrique*, 1902, as quoted by Wirtheim, Chapters in Winkel's *Handbuch der Geburtshulfe*.

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DISCUSSION.

Dr. Charles A. L. Reed of Cincinnati, Ohio, thought the essayist had so thoroughly analyzed the case that it was difficult for one to respond to the request to discuss it, as there was very little left to say. It raised some questions, however, in regard to treatment. He would mention this, not by way of criticism, because he thought the delay or absolute failure to operate in this case may very justly from the obscurity of the essential pathological lesion, from the confusion which arose from the masking influence of the puerperal state. An important lesson was impressed upon some of the members at a meeting of the Southern Surgical and Gynecological Association by Dr. Cartledge, of Louisville, in which in the parenchyma of each uterus exhibited by Dr. Cartledge there were demonstrable accumulations of pus. This led to the question of when and when not to do hysterectomy in such cases. It struck him that this case, with the pus tube undectectable, only added one possible condition which would point to the reason why perhaps these cases should not be subjected to operation earlier, and in a more radical way than they had been heretofore.

The pathological phenomena presented were interesting. With a double pus tube, with conception, it followed that the deduction of the essayist to the effect that the infection of the tubes was unilateral prior to impregnation was absolutely incontestable.

The probability was that this infection resulted from a progressive invasion of the mucous structure, which served as a nidus of infection occurring within the uterus following delivery. The fact noted in Hare's case, quoted by the essayist, to the effect that the tubes were infected between the site of an extrauterine pregnancy and the uterus, was a demonstration of the possibility and of the necessary fact that the infection in that particular case must have traveled from the endometrium toward the fimbriæ, and it followed conception.

Dr. Herman E. Hayd of Buffalo, N. Y., did not suppose this was a very rare condition, excepting that it represented multiple

pregnancy. He was inclined to believe that we saw a great many more cases of pyosalpinx complicating pregnancy or delivery than was heretofore supposed. In all probability they were due to a latent gonorrhea existing in the tube, which sprang into activity as the result of the trauma of labor. It would seem to him that it was an exceedingly difficult matter to follow the essayist in the mode of infection, that the left tube should have necessarily been infected from a leak of the right open fimbria. He thought it was a very rare route for infection to take. The fact that both tubes were involved suggested to the speaker that they were primarily implicated, but it took longer for one to become involved than the other.

Dr. Charles L. Bonifield of Cincinnati, Ohio, said the fact was that in some of these cases of pus tubes the patients became pregnant, and one had every reason to believe that many cases of double pyosalpinx sufficiently cleared up in themselves to allow patients to become pregnant. In times gone by he had been imprudent enough to tell patients that they would never become pregnant when he had detected a mass on each side, and there was every evidence of pyosalpinx, and on a few occasions he had been surprised, after six to twelve years, to find that the pus had become absorbed and the women had become pregnant. He thought in all probability Dr. Hayd's explanation was correct—that this woman had an infection of both tubes. There was a mild infection probably of both tubes, and the hyperemia coincident with pregnancy had undoubtedly lit up the acute stage. The case of Hare, quoted by the essayist, he thought an exception rather than the rule.

He recalled a case in which a woman had a double pyosalpinx, but refused operation. Everything in the pelvis was matted together; she gradually grew better, and at the end of six or eight years became pregnant and he delivered her. She went through labor easily, but at the end of one week she suddenly raised up in bed and dropped over, dead. Evidently a thrombus was carried from the infected neighborhood to the heart.

Dr. Rufus B. Hall of Cincinnati, Ohio, disagreed with Dr. Bonifield that a woman could have double pus tubes and afterwards become pregnant. He did not disagree with him in the statement that he could have a patient in whom he could make a diagnosis of double pus tubes from an enlarged mass or firm adhesions on either side, because all knew how difficult it was to say that we had a pus tube or we had not a pus tube until the abdomen was opened and search made for it. We might have a large inflammatory mass, the patient might recover, and she might become pregnant; but in view of the pathology of a pus tube and the necessary closure of the fimbriated end he could not conceive of absorption taking place and liberating the fimbriæ again, so that the patient could become pregnant. Yet this might be true. But he wanted the speaker, before he said this, to prove that they were pus tubes.

In regard to the case of the essayist, was he or was he not

justified on the fourth day, when the woman had a temperature of 104°, when she was going to die of puerperal sepsis, in making some kind of an operation to give the patient the additional chance of recovery? In his opinion, the patient would possibly have stood a section then, and this would have given her an additional chance for life. One disliked, however, to do an operation on such a case.

Dr. John Young Brown of St. Louis, Mo., said that from a pathological and surgical standpoint the case presented by Dr. Elbrecht was of extreme interest. He agreed with the previous speakers that the mere existence of pregnancy (in this case multiple pregnancy) precluded the possibility of the woman having had bilateral pyosalpinx. The pathology, as revealed by the autopsy, showed conclusively that the case was one of unilateral pyosalpinx, which had lain dormant and was lit up by the trauma of labor; that the leakage from the pus tube produced the diffuse peritonitis and the condition found in the other side was due to the bathing of the infected side with pus that had previously existed, and had brought about the peritonitis. Surgically speaking, he thought the vagueness of the case emphasized the importance of an exploration. The case, as reported by the essayist, showed that on the fourth day the woman had a temperature of 104°, and with the local conditions that were present he thought the surgical indication in this case was perfectly plain, and that an exploratory operation should have been done, followed by a thorough treatment of the local condition.

Dr. James F. Baldwin of Columbus, Ohio, emphasized a fact that was being brought out every once in a while that we could pay little attention to the pulse in determining the matter of peritonitis. Only a few months ago he was called at 9 P. M., Monday, to see a boy who was taken sick on the previous Thursday. He had had previous attacks which indicated possibly an appendicitis. The parents saw him during these attacks with the physician, and they thought it was a case of indigestion. He vomited and had considerable pain. On Friday he was playing and went to the theater in the evening. On Saturday he was playing and went out skating on the street during the afternoon. On Sunday he still had pain (bellyache, as they called it), but no special trouble. Sunday afternoon they sent for a physician. The physician was an exceedingly intelligent man, who overlooked appendicitis. The boy was suffering constantly, but had an absolutely normal pulse and temperature. He was simply suffering from pain. The bowels had been opened. He had not vomited since Thursday. He had been given morphine. He was seen again in the evening by the physician; had a normal pulse and temperature. More morphine was given, on account of pain. He now had a scaphoid abdomen. He was seen again the next morning. This was Monday. He again had a normal pulse, but the severe pain continued, so that a little more morphine was given, and in the afternoon the temperature was 100.1°, with a corresponding acceleration of the pulse and vomiting, and tenderness could be made out.

At the next visit, a few hours later, the temperature was found the same, the pulse a little more frequent, and the physician thought he could make out a mass in the region of the appendix, but was in doubt. He saw the patient after supper, at eight o'clock; the temperature was the same; pulse, 130; but no abdominal distention, but tenderness was more diffuse. Dr. Baldwin was then called in consultation. There was a scaphoid abdomen; not the slightest distention, but a little tenderness, more over the site of the appendix than anywhere else, but no vomiting; temperature, 100.5°, pulse being 140 at this time. The boy was seriously sick, and he could not say what the trouble was. On general principles, however, he advised an immediate operation, and fortunately the parents consented. The patient was taken to the hospital and operated on at eleven o'clock. He made the usual incision over the appendix, when pus poured out in large quantities. He found that there was not the slightest attempt to the formation of protective adhesions. There was a general purulent peritonitis. He made a free incision, owing to the fact that there was found absolutely no tympany. He introduced a rubber tube, washed out the abdomen throughout, all around the spleen and stomach, and made another incision up around the liver, so as to get two openings to establish good drainage, and put the boy on his side in bed. Greatly to his surprise, the boy recovered.

Here was a case that went on from Thursday morning until Monday afternoon without any elevation of temperature, with practically no acceleration of the pulse rate, without any vomiting, hiccoughing or abdominal distention, and excepting for the fact that the parents permitted him to operate the patient, in all probability, would have gone on to death without any symptoms except the pulse as an indication of peritonitis. This case taught the lesson that in some cases one might have extensive peritonitis with but little or no elevation of temperature, or even a temperature that was below normal.

In reference to the remarks of Dr. Hall, while he had not had a case of double pus tubes with pregnancy, yet he thought it might occur. He recalled a case of tubercular peritonitis upon which he operated a number of years ago. The adhesions were universal. These were separated widely. He put in temporary drainage, the woman picked up in flesh, became practically entirely well except that she had at the lower angle of the wound, where drainage was inserted, a fistula which annoyed her. She was anxious to get rid of this fistula. He operated and was amazed to find how absolutely free the peritoneum was from tubercular adhesions. These adhesions had disappeared. He was not in a position to say that the adhesions which may surround a tube and involve the fimbriated extremity as the result of pus would disappear as they did in this case, but by analogy this might be assumed, and with Dr. Bonifield he thought that there might be rare cases in which pregnancy could follow bilateral pyosalpinx. These conceptions took place, and one had reason to believe that there had been a long-

standing mass of adhesions with complete obliteration of the tube for years, yet pregnancy followed after fifteen or sixteen years. He recalled one case in which ectopic pregnancy occurred sixteen years after.

Dr. Lewis S. McMurtry, of Louisville, said that the great value of the paper that was the basis of the discussion was that it constituted a substantial addition to the scanty literature of this particular phase of pyosalpinx. There was one point that needed emphasis, and that was the great difference there was in viewing any particular case after the revelations of a post-mortem examination, or after the termination of the case, and before. Abdominal section in puerperal convalescents was a very serious step. Vaginal incision and drainage, so enthusiastically advocated and practised by Pryor, would, in a case like the one under discussion, accomplish very little from the standpoint of therapeutics.

In the case presented we all knew that the entire array of symptoms presented prior to the collapse of the patient, could be produced by the classical condition of puerperal sepsis that was described, and with which all were familiar; in other words, a septic infection of an uncomplicated character following a normal labor. Day after day the symptoms, intelligently interpreted, would have indicated in this case puerperal infection following labor. On the day preceding the collapse of the patient there was a defervescence, the temperature subsiding and the pulse being then within safe range. He was not sure, but thought there was not a single Fellow who, had he been introduced to such a case, would have for a moment tolerated an abdominal section, as in a few hours the patient was in a condition where no operative interference could have availed.

Dr. Joseph Price of Philadelphia regretted that he had not heard the paper. He thought many forms of puerperal infection and symptoms of peritonitis were commonly overlooked and unwisely interpreted. Apparently good clinicians failed to understand at times the meaning of subnormal temperatures in the angry, vicious forms of peritonitis.

Dr. Elbrecht, in closing the discussion, said that most of the speakers who discussed his paper were inclined to believe that the case was a suitable one for operation. No one was more anxious to operate early than he, but with the clinical picture of ordinary sapremic infection of a puerperal uterus, on the fifth or sixth day, he did not think there was a man who would have opened the abdomen. If he were to operate on cases with such a clinical picture as was presented in this case, with a pulse of 125, a temperature that fluctuated one day and was normal the next, he would operate on from twenty-five to fifty women in a year. At the institution with which he was connected they delivered on an average four hundred women a year, and of that number there were twenty-five to fifty who ran this typical course of sapremic infection, where on the fourth or fifth day the temperature rises, and, if vaginal douches were given, in two or three days it would decline. When the temperature did not subside, from the

douches given, on the fifth day, in this case, a blod culture was made, and found negative, which proved that it was a local and not a general infection, and with the stinking lochia he had no right to believe anything else. There were no symptoms of peritonitis. The group of symptoms presented in his case was not sufficient to have warranted an operation.

SOME CONSIDERATIONS ON THE AFTER MANAGEMENT OF ABDOMINAL SECTIONS.*

BY

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In saying what I desire to present on the above topic, I shall assume that proper care was exercised to insure the best possible condition for operation, which should include the previous building up of the patient by hygienic measures, proper diet, the use of such medicines as would put the digestive, eliminative, nervous, and muscular systems in the best possible condition to withstand the shock and debility incident to the operation, with the patient's vital powers raised to the highest degree of resistance. This will include such a wise management of the case on the part of the attendant as will relieve the mind of anxiety, which in some cases demoralizes the patient to such a degree as to menace the results of surgical interference, and the safety of the patient.

In reviewing my personal experience I am led to the conclusion that the principal and by far the most frequent disturbing condition after laparotomy requiring treatment is flatulence. The accumulation of gas in the intestinal tract is present to a greater or less extent in a majority of cases. The principal causes are reversed peristalsis, intestinal paresis, and the effect of the anesthetic.

Nausea and Flatulence.—The causes of nausea are multiple and should be carefully differentiated. If reversed peristalsis continues, nausea, or nausea and vomiting will follow. Among them should be further noted the results of anesthesia, shock, peritonitis, uremia from suppression of urine due to the anesthetic, and the nausea and vomiting induced in some patients by the administration of mor-

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phia, and by septicemia. The local influence of hot water on the nerves of the stomach to allay both nausea and vomiting is well established, while stomach irrigation often affords marked relief. I usually commence the use of 3i to 3ii of hot water as soon as it appears after the operation.

In persistent functional vomiting small doses of cocaine, gr. 1-12 to 1-10, given by mouth, are very efficient, acting at the same time as a powerful nervous stimulant.

I seldom give anodynes except in conditions of pain, making a possible exception in cases when peritonitis was present prior to the operation, or other structures involved in the operation were so friable that peristalsis should be prevented for a time, or in cases following intestinal anastomosis. Its administration for the relief of pain is admissible and perhaps mandatory. It is a matter of much moment what anodyne is selected. Ordinarily I use codeine hypodermatically in doses of gr. ¼-½, or more if required. While its power to relieve pain and check peristalsis is much inferior to that of morphia, its lesser disturbance of the nervous system, checking of secretions, and tendency to induce constipation makes it an agent of great value. It is imperative that a reliable preparation be used. Unless one knows the susceptibility of the patient to the disturbing influence of morphia, especially its liability to induce nausea with vomiting, there is no way of knowing whether these symptoms are the result of the drug, whether it is due to the anesthetic, or to some independent cause connected with and growing out of the patient's condition. A grain or two of codeine may be taken hypodermatically without discomfort, given in divided doses until the desired results are obtained. In troublesome cases of continued nausea the administration of small doses of cocaine, gr. 1-10 or 1-12, exercise a salutary sedative influence on the nerves supplying the stomach, and is attended with happy results. Either the nausea or flatulence, or both, may disappear in a few hours after operation.

Occasionally the flatulence is of longer duration, and frequently very persistent. When it persists, it may be necessary to use salol or some other intestinal corrective. Except in conditions already noted, efforts to evaculate the bowels should be instituted within twelve to twenty hours subsequent to the operation, and in some cases earlier.

In these conditions the giving of drastic cathartics, vegetable or mineral, is of doubtful expediency. Should the feces become hardened, high enemata containing ox-gall are useful, and a simi-

lar administration of warm olive oil facilitates an evacuation. An alum enema in reversed peristalsis often has great efficiency.

Not infrequently the rectal tube, passed high enough to allow the escape of the imprisoned gas, will add greatly to the comfort of the patient.

Among the newer remedies for the relief of intestinal paresis is the alkaloid of the Calabar bean. Salicylate of physostigmine, given in doses of gr. 1-100 to 1-50, or even more, hypodermatically, repeated once in four hours, seems to induce a powerful contraction of the circular fibers of the intestinal tract.

Fortunately the vomiting of anesthesia subsides as the blood is freed, by respiration, of its presence. If due to peritonitis, the treatment must be directed to a removal of the cause. Testimony is increasing that ice, or the abdominal coil filled with ice water, has some controlling influence in the treatment of peritonitis. Drainage, with the shoulders of the patient elevated to a greater or less degree, has been proven by the Fowlers to be surprisingly effective in septic peritonitis.

If we except peritonitis of traumatic origin, the plain indication in all these conditions is evacuation of the bowels. In presence of nausea with or without vomiting cathartics administered by mouth are unlikely to be retained, and the ability of the stomach to absorb fluids is lessened and often abolished. Under this condition calomel may act in a very salutory manner. Given in one-tenth or one-fifth grain doses, hourly, it is sometimes most effective. The antiseptic and sedative influence of bile on the intestinal tract is too well known to require comment. If, as has been claimed, the stimulative effect on the secretion of bile prevents the resorption of the bile, as is usual in health, its value is easily seen. Following or associated with this a high enema of half a pint or a pint, containing from one to three drams of sulphate of magnesium, repeated once in four hours, is usually effective.

The passage of gas by rectum after laparotomy is always a sign of hope to the operator and a source of relief to the patient. Liquid stools at this juncture are an added proof that reversed peristalsis or incipient paresis of the intestines has diminished or has disappeared. My experience with cracked ice, or cracked ice and champagne, once so popular, is on the whole disappointing, and I now use it infrequently. The power of ice to lessen thirst is too often delusive. In fact in health the holding of ice in the mouth for some time, creates an irritation resulting in thirst, which is pro-

longed surprisingly after its use is discontinued. Partial or complete suppression of urine is occasionally the essential factor in producing nausea and vomiting. Its relief depends on prompt establishments of the renal function. In order of efficiency the following remedies promise most; dry cupping; catharsis by high rectal enema containing salines; rectal irrigation, and if the patient's condition permits, particularly if accompanied with dry skin, one-tenth grain doses of pilocarpin. In septic conditions involving the abdominal contents, prompt catharsis, pelvic drainage with the shoulders elevated when drainage is admissible, with the use of antitoxins, and free stimulation are the measures most likely to conserve the life of the patient.

Diet.—The diet of patients after abdominal section calls for the greatest circumspection, always following the rule that nourishment, by the mouth, before the stomach retins or digests it, is positively harmful. My custom usually is to commence the use of hot chicken or mutton broth as soon after laparotomy as it is retained and digested. This may be succeeded by predigested albumin and the juice of lightly broiled steak, as soon as the stomach will tolerate it, to be succeeded by farinaceous food—preferably well-cooked rice. The notion that animal food alone is applicable in these cases is based on a misconception of the needs of the economy and its supposed unfitness to fulfil the indications present. As a rule, the use of milk, unless it has been peptonized, had better not be ventured upon. The liability to a form of mild ptomaine poisoning from undigested curds of casein has doubtless added materially to the avoidable mortality of laparotomies. When the appetite is lacking and the stomach will not digest food, resort should be had to high nutritive enemata of digested milk, concentrated beef juice, and if indicated, whiskey. In this connection the nutritive and sustaining power of alcohol should not be neglected. When the digestive power of the alimentary tract is reestablished a full diet, tempered with proper discretion, should be employed.

Shock.—The avoidance and mitigation of shock in abdominal operations calls for the most careful observance and treatment on the part of the operator. The predisposing causes embrace every influence which impairs the normal vigor and vital resistance of the patient. The exciting causes of shock are direct traumatism, including the exposure and manipulation of the pelvic contents, hemorrhage, and septic conditions, to which must be added the influence of anesthesia and abnormal reduction of bodily temperature.

Shock is attended with grave disturbances of the sympathetic nervous system. Vasomotor paralysis and vasomotor spasm mark its onset and continuance. The causes which lead to it are multiple and complex. These vasomotor disturbances appear differently in different cases, or perhaps alternate in the same case.

In one case there is inhibition of function, in another overstimulation. The causes which lead to general capillary stasis with capillary dilatation must be distinguished from those which are due to capillary spasm and resulting spasm and closure of the same vessels. From the physiological standpoint, digitalis or ergot should relieve the former, and nitroglycerin the latter. There must, however, be some limitation as to the application of remedies from their established physiological effect only. Unless their therapeutic influence corresponds with their physiological effect their use should not be carried too far.

A correct analysis of the cause of shock leads to correct and rational treatment. Sometimes two or more causes operate simultaneously, and it is to meet the real indication that correct deductions are so needful. This embraces the after-influence of anesthesia and internal hemorrhage. So, too, the influence of traumatism, *per se,* and hemorrhage may puzzle the attendant. Persistent hemorrhage (which demands opening of the peritoneal cavity) is attended with persistently increasing muscular weakness and rapidity of the pulse, and is not so susceptible to relief by stimulation of any kind as the depression due to traumatism. In fact, the former may be aggravated by any heart stimulant.

Without attempting to follow out any exclusive line of reasoning as to the physiological or therapeutical application of drug medication, both on the circulatory and nervous systems, I desire to make some suggestions as to their rational and empirical use.

Exsanguination from hemorrhage, causing an arrest of muscular contraction of the cardiac muscle, arising from absence of blood in auricle or ventricle, cannot be remedied by any form of heart tonics. Change of position, which by gravity facilitates the return circulation, may be useful. The rational remedy is to give the heart its natural stimulus—a new volume of fluid. No time can be lost in subcutaneous saline injections, but the sterile normal salt solution must be introduced directly into the venous circulation. In operations following ectopic rupture, where the bleeding points had been secured, I have seen apparently hopeless cases, absolutely pulseless, quickly rescued by injecting a pint and a half of salt solution into the median basilic vein, and succeeded by rapid

convalescence, when cardiac and general stimulants had been wholly unavailing. When, in shock, there is over-stimulation of the cardiac inhibitory apparatus, attended with infrequent pulse and vital depression, atropine is the remedy, *par excellence*. The paralyzing influence of atropine on cardiac inhibition is so prompt and salutary, as to make it, so far as our present knowledge of drug action goes, the rational therapeutic and physiological remedy.

When shock manifests itself by cardiac muscular weakness and want of nervous energy, strychnine hypodermatically, is among the most efficient remedies, gr. 1-40 or 1-50 once in three hours, not exceeding a maximum dose of gr. 1-6 or 1-5 per day. Perhaps next in efficiency are sparteine sulphate, gr. ⅛-¼, or caffeine, gr. i. To get the best results from sparteine it should be administered once in three hours. The former belief that a grain in twenty-four hours was a maximum dose is a mistake. Double that quantity may be given unless its power is manifest.

After all, when shock is profound, minute doses of morphine sulphate are among the most powerful stimulants, and superior to most for prompt and sustained effect.

Bodily Temperature.—The attendants and nurses who lack a lively appreciation of the necessity of maintenance of temperature up to the normal standard of the body subsequent to laparotomy, are liable to create a loophole of danger, into which their charge may unwittingly fall. I say "attendants and nurses," for if the attendant does not recognize its importance, the nurse can hardly be held responsible. Subnormal temperatures demand *immediate attention*. Keep the patient dry and warm. When subnormal temperature is attended with profuse perspiration, drying the skin is of the highest importance. Evaporation of moisture always depresses temperature. To combat this, one aid I have never seen mentioned, but to which I have resorted for years, is the application of dry heat, for the double purposes of stimulating and drying the cutaneous surface. This is accomplished by enveloping a piece of hot brick or pottery in linen cloth, which is passed slowly over the skin, underneath the bed covering and clothing, by which area after area is made dry and warm. By such method the best effect is most speedily obtained. Unless the condition of the circulation and pulse contraindicate, atropin, gr. 1-100, should be used hypodermatically.

In conditions of great depression, due to inadequate power of circulation, the lower portion of the trunk should be elevated and

the head lowered. This aids in restoring and maintaining a proper supply of blood to the brain.

To want of discrimination concerning special heart and nerve stimulants, with imperfect appreciation of their application, judged first from their physiological action, second, by their therapeutic effect, and the exact indications for their use, is chargeable some of the disasters which mark the work of well-meaning and skilful operators.

Position.—The position of the patient in bed after laparotomy has received too little consideration. Enforced immobility of the patient is in most cases a species of refined cruelty. Without entering into a discussion of the causes of the atrocious backache which usually follows laparotomy, its relief is entitled to consideration. First, the sagging of the spinal column occasions a dragging on and weariness of the lumbar muscles which needs relief. Often a hard pillow or unyielding roll of cloth, lifting the small of the back, is a source of great comfort. Elevation of the knees tends to relieve the tension, and is grateful. Intestinal distention is an important factor in this ailment, and its relief is most grateful. The pains of flatulence must have appropriate treatment. Enforced extension of the legs is usually uncalled for. Too often, after the anesthetic, the head has no support of the pillow. This increases epigastric tension and often occasions unnecessary distress. Raise the patient's head to the degree most comfortable. Except after intestinal anastomosis, or the suturing of friable structures, begin as soon as possible without augmenting abdominal pain or tension, to roll the patient from side to side, until the most comfortable position is found. When for sufficient reason rigidity is required, give lateral support to the thighs and legs to relieve the involuntary strain which follows effort to prevent rolling of the legs. In changing the position of the patient mechanical support is required; do not rely on some compressible material like a soft pillow. Use something of more resistance—a tightly rolled blanket, a book, or some other incompressible object—covered with something soft. These considerations add not a little to the sum total of comforts which count in the ultimate finals of success or failure.

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DISCUSSION.

Dr. James F. Baldwin said the paper contained points that were at variance with what had been the teaching of some surgeons for a number of years. The essayist had referred briefly to the use of opiates, morphia or codeine after abdominal section. The

speaker saw no objection to the use of the stronger opiate—opium, especially for the first night. He was pleased to hear the essayist refer to the moving of the patient from side to side by the nurse for a few hours following operation.

As to the use of dry heat following operations, especially if there was a tendency to subnormal temperature, the form of heat he had found best and most comfortable and satisfactory was the use of electrically heated pads; they weighed practically nothing; they gave a uniform temperature; they were adapted to the irregularities of the body, and there was no danger of producing any burns.

Another point which the essayist mentioned, but did not emphasize, was the use of fluids after operation. The teaching of Tait, he believed, was that no fluids were to be given for forty-eight hours after operation, no matter how much the patient suffered. For the last two or three years he had been using water freely as the patients called for it. The patient would drink it freely the stomach was washed out; the ether was gotten rid of, and since doing this patients had had much less suffering from prolonged vomiting. Hot water relieved thirst. Cracked ice was a delusion and a snare, and very unsatisfactory.

Dr. Francis Reder of St. Louis, Mo., said there were some patients who did not require any attention after laparotomy. Then, again, one would meet with cases where everything one did would afford no relief. He was particularly gratified at the allusion of the essayist to the care of the patient relative to position. This could be left to the nurse when she was familiar with her physician's directions; but, as a rule, he believed it was the duty of the surgeon to look after the patient, particularly for the first forty-eight hours after operation. The only exception he took to the moving of the patient was after operation. He thought there was danger attending the moving of a patient forty-eight hours after she had been subjected to a laparotomy. He had had a number of unfortunate cases in the way of thrombotic formations, and in some cases one should avoid moving or handling the patient. Sometimes these patients must be moved. He thought it was well to support every part of the patient's body, because no one knew, unless he had undergone a laparotomy, what it was to suffer from backache. By relieving all strain, there was a tendency to give the patient comfort, and great comfort was necessary for the first forty-eight hours to insure a happy result.

Dr. Lewis S. McMurtry said that in the early days of abdominal surgery surgeons went to extremes, as, for instance, requiring patients to keep perfectly quiet on their backs, to abstain from all fluids for forty-eight hours, and to avoid all movements of the body. Now the tendency was to be very radical in the other direction. Since this meeting began he had heard that there was a distinguished surgeon in New York City who pursued the practice of having his patients get up the next day following abdominal section, and to leave the hospital at the end of a week. A gentleman who was conversant with the methods of this eminent

surgeon talked about it yesterday. This gentleman saw him operate on a case of double pyosalpinx in which a long incision was made and universally adherent tubes removed. The operation was done at five o'clock in the afternoon. He saw the patient sitting up and drinking milk the next day at eleven o'clock. These statements were absolutely reliable. He understood there was also a surgeon in Chicago who advocated the same method and practised it, namely, doing abdominal sections and having his patients up the next day and going about, and at the end of a week sending them home, telling them to go where they pleased and to do what they desired. He thought this was going to an extreme, and the proper plan was to consider those surgical principles which were classical in the treatment of wounds, and apply them with common sense and with good surgical judgment. If one had a wound of the arm or leg, of the soft tissues, or any injury of a bone, it was known that the best way was to secure rest of the part or parts and thereby facilitate healing. This principle in surgery was well established. It did not facilitate healing of a wound materially for a patient, after an abdominal operation, in whom a long incision had been made, to be up the next day and at the end of a week turned loose and do whatever she wanted to do. Here we had two extremes. Surgeons had started with one extreme, and now the tendency was to go to the other extreme. A middle ground in such cases was the correct one.

Dr. Samuel W. Bandler, of New York City, said an agent which was of value was physostigmin. Every case of laparotomy was given the eightieth of a grain of physostigmin hypodermically every three hours, and it had seemed to him that intestinal action was better, in that the patients passed gas earlier than without this agent. However, the house surgeon at the Post-Graduate Hospital had informed him that in his opinion patients did no better with this agent than without it.

As regards the statement of Dr. McMurtry, concerning the early rising of patients from bed after operation, he could only say that this distinguished New York surgeon was a friend of his. He had watched many of his operations, and it was surprising to see him operate at four o'clock in the afternoon to-day, for instance, do an abdominal hysterectomy, and to-morrow afternoon to see the patient sitting up and possibly walking around the wards. This surgeon did this frequently. The advantage of the vaginal method, as it seemed to him, was that the patient could get up quickly—say, on the third day—and perhaps on the fifth day could go home. Now, with the method of allowing patients to get up the day following operation, it appeared to him that almost the last leg, so to speak, was taken away from the advantages of the vaginal method. If a patient could get up on the second or third day after abdominal operation, then there was no particular advantage to be derived from operating vaginally.

Dr. Herman E. Hayd said that this paper brought before the association the whole subject of abdominal surgery, and that

gradually, by a process of evolution, we had become reasonable and scientific. It was just as absurd a few years ago to say that every case should be drained as it was absurd to say no cases should be drained. A certain class of cases required drainage, while others did well without it. If a surgeon or a physician was to be successful in his work he simply had to use common sense.

Every day he came in contact with doctors who surprised him by the absurd concoctions they were giving patients, and also by the absurd directions they were giving. He thought we would accomplish most in the treatment of these cases if we appealed to the common sense and to the judgment of the patient.

So far as the use of hot water bottles, rubbing of the back or propping patients up with pillows were concerned, he had never seen anything that would help a backache after operation. The more one did for these patients, the more he had to do for them. They were dissatisfied with the efforts one was making for the relief of suffering. He thought it was unwise to permit patients to sit up the day following laparotomy. He considered this most unwise teaching.

Dr. Joseph Price said that wonderful progress had been made in abdominal surgery, and that America had contributed more to its development than the rest of the world. By recent and up-to-date practices surgeons had lowered the mortality very materially; in short, the mortality of every well-trained operator in this hall was lower at present than before, for the reason that he had more confidence in his methods, more confidence in the preparation of his patients, and more confidence in the after-care. There was less fuss and feathers and foolishness about the care of his patients. He thought there was a great deal of danger in allowing patients to get up too early after operations.

Dr. Chase, in closing the discussion, stated that his paper was simply intended to be suggestive. He thought there was a happy medium which was attended with safety. Some men who allowed their patients to get up two days after operation, and to go about, undoubtedly succeeded. He, however, would never succeed, because he should never try it. He would like to have such men give their results as to how many of these patients who were allowed to get up at the end of three days, at the end of three months were in their graves, then he could judge whether this was proper treatment or not. The question resolved itself very largely into one of movement or non-movement, or the use of fluids or not. Slight shifting of patients from side to side gave comfort. If there was no vomiting, nothing should be given, and if relief could be afforded by hot water it should be given. He again desired to emphasize the use of physostigmin. He had found a close relation between traumatism from handling of the intestines and the getting up of patients. If the operation required a short incision, there would be little or no trouble. Physostigmin contracted the circular fibers of the intestine, and on that account it was invaluable.

SOME GENERAL PRINCIPLES IN CONSERVATIVE PELVIC SURGERY.

BY
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This subject will be considered under the several postulates named in the abstract printed in the programme, which are:

1. It is decidedly advantageous to have a general knowledge and a general experience before making use of special methods in the treatment of pelvic disorders.
2. Medical and mechanical means should be tried in suitable cases before resorting to surgical intervention.
3. Only diseased organs should be removed.
4. Sound organs and normal parts of unhealthy organs should be preserved.
5. Conservative plastic surgery should be employed to save such organs as can still be made functional or to serve some useful purpose.
6. Diseased organs should be removed in the order of their pathological precedence and importance, with a view to benefit the patient by promoting her comfort and prolonging her life, even if a perfect cure is not to be expected.

THE elementary and fundamental knowledge which a student of medicine must have before he can practise is now regulated by law. Formerly a graduate of medicine might begin the practice of his profession with comparatively little preparatory knowledge and experience. The knowledge which such a graduate had acquired was general in the sense that he was expected and required to know something of the various branches of medicine, surgery and obstetrics, but he knew practically very little of any one of the general subjects, and he certainly could not have practised exclusively and with that degree of precision and comprehension necessary for success in such a specialty as that of the eye, the throat or the female pelvic organs. A specialist who has had neither a general hospital training nor a general private practice cannot have that exact and comprehensive view of his subject which *he* can have who has had long and thorough and general training under the guidance and instruction of experts or who has worked out his own experience at the bedsides of private patients afflicted with all manner of diseases. To have the necessary general knowledge which prepares one to recognize the variety of disorders which affect

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the various organs of the body, and to be able to distinguish the priority of a particular malady and its bearing upon other maladies, as well as to know which organs are essentially normal and which are essentially diseased, presupposes a general knowledge and a general experience which an exclusive special practice can scarcely supply. Certain local and specific abnormalities may be recognized, and a course of artful treatment prescribed, but an acute, accurate, exhaustive diagnosis of the disease or diseases present is not to be confidently looked for.

When a specialist combines the knowledge and experience acquired in general study and general practice with the knowledge and experience which specialism affords through detailed observation, experimentation and concentration of thought, he should have an equipment for efficient and successful practice which should be well nigh irresistible and irreproachable. Even the laity regard a strict specialist as narrow, and some members of the profession, as well, consider absolute restriction to specialism as dwarfing to the professional mind.

A specialist in law, in engineering and in the sciences should have more than a smattering of knowledge of the principles of his profession and of collateral subjects. Specialism in medicine, as we all know, has already been carried so far as to have almost caused the passing of the "family physician."

Some are disposed to think that this is fortunate and really to be desired, but not a few regard such a sweeping change as deplorable.

In the treatment of pelvic diseases a knowledge of general internal medicine and of the general principles of surgery is of the first importance to the patient, and must be of the highest advantage to the physician himself. Why the reader believes this to be so will appear further on in the conclusions which may be drawn from the several propositions of the abstract.

Our second proposition would have met with more favor a quarter of a century ago than to-day. And the physician then and at the present time would be more in accord with the therapeutics and practical use of medical and mechanical means of treating pelvic diseases than the surgeon would be. We may dare to say that surgeons welcomed the coming of operative measures as substitutes for medical and mechanical methods of treating pelvic disorders, for they, before all others, had become skeptical and discouraged at the tedious and uncertain course of treatment in those diseases locally considered.

Had the physicians of twenty-five years ago known as much

about the diseases of the nervous system as is known at the present day, had they known of tuberculosis, had they known as much as is now known of the effect of one deranged function upon other functions, had they been able to understand the bearing of a particular disease on the rise and course of certain other diseases, in the light in which it is now understood, they might have had much greater success in the use of non-surgical means, and the day for a medical change would have been postponed, and the transition from nearly exclusive medical treament to almost exclusive surgical treatment would have been markedly modified and, it may be postulated, to the advantage of all concerned. The wholesale wiping out of gynecological therapeutics was unique as compared with reforms in other specialties. Aurists kept on with tentative methods of treatment and did not stop catheterizing and electrifying the eustachian tubes; laryngologists continued to swab the nostrils and to spray the windpipe. All the acute inflammations and catarrhs recurred as usual and were sounded and injected and powdered much the same as before, while it became derogatory to a physician's reputation for skill and common sense to employ similar time-honored means in treating kindred affections of the vagina, the endometrium and the fallopian canals. The art of using a pessary and the tamponade was nearly if not quite lost, and, with the loss of the art and skill and ingenuity which had made the gynecologists of years ago masters of the methods they employed and found useful, there came the detraction and the abomination which led to the almost complete abondonment of everything medical and mechanical, whether good or bad. Those who have had much experience in the use of pessaries and tampons know that they are neither quite useless nor wholly pernicious. A well-formed and properly fitted pessary may be very useful in some cases of uncomplicated displacements of the uterus; either as a temporary expedient or curative, especially in postpartum conditions. The wool-tampon (also a pessary as well as a compress) is likewise useful in similar cases for a time, to prepare the patient for operative or other treatment. These agents, like drugs, should be discontinued when they have served their purposes and have for those reasons become unsuited to the cases in question.

The therapeutics of gynecology should be as the therapeutics which are employed in the treatment of other organs of the body, local and general, with a view to correct all the disorders of the system as far as may be, and as may be determined by

the generally and specially well informed, wise and skilful physician.

When it is obvious to the experienced observer that a pelvic organ or several of the female pelvic organs are hopelessly diseased, it becomes a question whether that organ or those organs shall be removed. According to the next proposition, sound organs are to be preserved and the normal portions of diseased organs are to be saved. We should not assume, because a patient imagines she may be better off without a certain part of her body, that she can dispense with it or that she has one less organ to think about, or that she will never know that she has lost anything worth saving.

When a hand is injured, or is diseased, we do not amputate the whole of it if we can possibly save a finger or the thumb or even a small part of one of those members. In this day and generation an eye, a tooth, a hair of the head receives every care and attention to preserve it. Physicians, dentists, scalp specialists, are agreed to employ every means and exhaust every effort to improve the condition and to prolong the existence of their special charges.

It seems absurd to state such an opinion, but the ease with which the female pelvic organs can be removed and the fashion of doing such operations these days (though perhaps much less foolishly fashionable than a few years ago) appear to have had a remarkable influence in promoting radical pelvic surgery. It has happened that a surgeon, having simply a trachelorrhaphy under immediate consideration, suddenly decided that the uterus was not healthful any way, and at once removed the organ, together with the tubes and ovaries, per vaginam. We are credibly informed that surgeons have removed the normal uterus and healthful ovaries without any apparent reason. In contrast with this it should be the invariable rule to remove diseased organs only. To this end fibroid growths in the uterus are enucleated instead of a complete excision of the uterus being done. And in hysterectomy for fibroids normal ovaries should be left intact. In this connection, furthermore, the psychic effect upon the patients by reason of oöphorectomy, should be borne in mind, and due regard should be given to this all-important and far-reaching consideration. If but one ovary is diseased, leave the sound one. If only a small part of an ovary is good, save it.

So simple a thing as puncturing numerous microcysts of an ovary, or the excision of one or two larger cysts may save a

considerable portion of the organ or, at least, prolong its function indefinitely and, besides that, save the patient from a round of psychical phenomena and other distressing nervous disturbances most trying to endure. The reader has many times left both ovaries because they were normal, or nearly so, and he has found no reason to regret it. He has left one ovary because it was good, and he has repeatedly preserved half or a third or even a fourth of an ovary, and has not been "taken to task" for it, or had subsequently to remove the remnant because it became enlarged or in any way troublesome.

Let us mention a case: a large dermoid cyst of the left ovary, a fairly good right ovary, though enlarged to several times the usual proportions of a normal ovary, a normal uterus, but retroflexed. Dermoid cyst removed, right ovary remaining. Marriage. Three successive pregnancies within seven years—two females and one male at full term. Mother and three children living, in good health.

Many radical surgeons will not agree to a proposition so ultra conservative. For such, it is not sweepingly radical enough to be brilliant, and they insist that it is too tentative and not curative.

To the radicals, conservatism in any degree seems irksome. The conservatives appear to have adopted a waiting policy, are timid, slow, at a standstill. But after all, it is a question of fact, of judgment and of ripe experience which should govern our action.

Radicalism without the guidance of conservatism, and conservatism without the energy, activity and promptitude of radicalism cannot give us the best attainable results. In the sense that conservatism and radicalism alike seek to mitigate the suffering and to promote the health and to prolong the life of the patient, the fight is an equal one and both contestants are desirable and useful. Best of all is it, when these restraining and progressive forces join hands and pull together.

Conservative plastic surgery has become an art worthy of the best operators. The separation of old and pernicious adhesions and the formation of new, serviceable and corrective ones will illustrate the meaning of our fifth proposition.

A Pryor operation for retrodisplacements of the uterus, a trachelorrhaphy to improve the structural condition of that organ, a colporrhaphy to correct cystocele and rectocele, a perineorrhaphy to restore the support of the vaginal column, are among the operations which should be performed as early

as possible after the existence of the malconditions has been discovered. Such operations are surgical restorations of the highest importance, which not only afford great relief and comfort to the patients, but also contribute largely to preserve the integrity of all the organs concerned. These operations call for large degrees of skill and ingenuity to perform them, but evolution in surgery, like evolution generally, has been and shall be equal to the demand for it.

The sixth and last proposition briefly refers to the order in which the several pathological states are, in the opinion of the reader, to be treated. In general, we should prefer to proceed from above downward, rather than in a reversed direction. If the approach were per vaginam alone, one would naturally follow the good rule of first using the curettage, with or without uterine irrigation, and then to open Douglas's pouch to remove as much as necessary of the adnexa. In the next place a lacerated cervix would be repaired, before narrowing the vagina, and that would be followed by a perineorrhaphy and at last an operation for hemorrhoids or fistula in ano. A diseased appendix might also be removed from below, but if an abdominal celiotomy were chosen in the place of a vaginal celiotomy, an appendectomy would be the first operation in order, and any other required supravaginal surgery would follow.

Aside from the rational, purely advantageous and convenient arrangement, there may be a still more important reason for selecting a particular organ for immediate removal, instead of leavng it for a imediate or later operation. I refer now to those cases in which the appendix vermiformis was the primary organ to become diseased, and was the original cause of the other factors in the case. An ulcerating appendix may cause general pelvic infection, pus tubes and other consequent and attendant pathological conditions. In such instances, the first and underlying cause should be attacked first of all. This having been done, improvement and even complete recovery may be the result without further operation.

322 East Avenue.

DISCUSSION.

Dr. William J. Gillette of Toledo, Ohio, in opening the discussion, criticised the leaving of ovaries that were diseased. One might not have occasion for regret in having left an ovary that was to all intents and purposes healthy, but this was by no means always true. It occasionally happened that a diseased ovary or the portion of the ovary diseased had not been eradicated, and the surgeon would be called upon to resort to a secondary operation

for its removal. Such an experience as this had recently happened to him, in which he was called upon to do a second operation. In this case general peritonitis followed, and the patient's life was lost.

The importance of conservative surgery had been impressed upon him in the removal of fibroids. He agreed with the author of the paper that the uterus was altogether too frequently removed in the past in cases of fibroids, and now the pendulum was swinging the other way. He felt sure that myomectomy would be done more frequently in the future than it had been in the past, and that the uterus would not be sacrificed in cases of uncomplicated fibroid tumors of that organ.

Dr. Rufus B. Hall thought we ought to practice conservatism in pelvic and abdominal surgery, but in the first place we should have a clear understanding of conservative surgery. He did not believe that it was conservative surgery to do a section on a woman and leave organs that would in all probability necessitate a second section within a year or two. He was just as anxious as the essayist, or the previous speaker, to practice conservative surgery in these cases, but he was not anxious to have these patients come back and demand a second operation, that ought not to be made. One should formulate a working rule and stick pretty close to the line, especially in intraabdominal surgery. It could be safely stated that if a patient had been the subject of gonorrheal infection and a tube or ovary was left, sooner or later she would come back for the purpose of having either removed, or she would not be cured. On the other hand, if a patient had not been the subject of gonorrheal infection, one could risk more in her case and say that he did not have to do a second operation. If the inflammation and adhesions that had come about followed an abortion or ectopic pregnancy that nature had cured, or even tuberculosis, one could risk more than he could in a case of gonorrheal infection. In his early work in trying to do conservative surgery, he saved an ovary and a tube for many patients with gonorrheal infection, but in almost all of such cases he had to reoperate, or they were operated upon by someone else. This was bad judgment, to say the least, whether the surgery was good or not.

Dr. Francis Reder said that the specialty of gynecology had been to quite a number of women rather unfortunate in this respect, in that in the bordering towns of large cities there were physicians who were building up sanitariums, with, say, from ten to twenty beds. These men went about the country and spent from six to eight weeks, seeing surgeons perform operations upon the pelvic organs, and thinking that these procedures were easy, undertake to do them on returning to their homes, at the same time forgetting the skill that they required, or the ability that these men possessed to perform these operations. They returned home with a feeling that they also could practice this specialty. He thought almost any physician could find pain in the pelvic organs upon examination. When a patient consulted a physician, and he made an ex-

amination, he could generally elicit evidences of pain in the pelvic organs, and as a result the woman was advised to be subjected to abdominal section. In many instances this scared women, and they went elsewhere. Many such cases had come under his care in which the repair of the perineum and the introduction of a pessary had saved them from abdominal section.

Speaking of conservatism in reference to the pelvic organs, he only wished to remark that it was the tubes that gave the gynecologist the greatest concern, because when there was a pathological condition of a Fallopian tube, that did not at the same time give further evidence that the tube ought to be removed, he hesitated to a certain extent, and perhaps finally removed the tube. Gonorrheal infection, if it could be demonstrated, would justify such a procedure, but, as one of the foregoing speakers had remarked, an inflamed tube, even though it could not be demonstrated that it was due to gonococcal infection, would eventually have to be removed. He thought the rule ought to be laid down sooner or later that an inflamed tube ought to be removed. Usually both tubes were more or less involved, and if this were the case it would be advisable to remove them, because if one was left it would have to be taken out sooner or later.

In regard to the ovaries, he made it a practice to leave the minutest particle, and frequently in re-examination after removal, he feared that he had not succeeded in leaving any portion of an ovary, yet in the course of time menstruation set in, which was a verification that some ovarian tissue had been left.

Dr. Samuel W. Bandler said that ovaries, in his judgment, could cause pain yet not be inflamed, and it was his experience in regard to many cases that a second operation was needed where only one ovary or one tube was removed, and he could say candidly that in those cases which he had operated upon conservatively, removing one tube and one ovary, or removing both tubes and leaving half of an ovary, he had yet to recall one instance in which he was not sorry he had not removed both tubes and both ovaries. The gynecologist was confronted with two conditions, namely: that if a patient desired to bear children or wished to menstruate, and one tube and one ovary were affected, and had to come out, she was taking the chance of whether to leave the other tube and ovary, and he thought the question should be put to such a patient: Are you willing to take the chances because you wish to menstruate or because you desire to have another child? The onus was put on the patient. Only on this basis would he do an operation at the present time.

Dr. Oscar H. Elbrecht, in answering the last speaker's remarks as to the radical method of removing both ovaries and both tubes in these cases, stated that he had, since the first of June, thirty-seven cases of pus tubes. If the ovary was normal, without any cysts, or without any infection of any portion of it, he allowed it to remain. He did not believe the gynecologist was justified in taking both of them out and thereby increasing the large percentage of neurasthenics which were produced by removing both

ovaries. One should leave a portion of an ovary on account of the mental effect. The radical removal of both ovaries was not justifiable.

Dr. Charles L. Bonifield said that the paper and discussion manifested two extremes, and he could not agree with either. He thought the man who did not have cause to open the abdomen a second time after doing conservative surgery did not have a good hold on his patients, and that they went to someone else a second time. A certain number of these cases were bound to require a second operation. On the other hand, a certain number of them did not require a second operation. Not long since he operated upon the wife of a professional friend, removing one tube and one ovary, as well as a part of the other ovary and part of the tube, and he had never had another case in all his experience that had given him so much satisfaction. He believed that the gynecologist should do everything possible to give women a chance to become pregnant. It was true that the removal of both ovaries did in many cases produce bad nervous symptoms. Whenever it was possible, the gynecologist should save part of an ovary. He thought Dr. Hall was right that the majority of cases were due to gonorrheal infection, and sooner or later an operation would be required.

Dr. Charles B. Burr of Flint, Mich., by invitation, spoke from the standpoint of a neurologist and psychiatrist, and stated that what the essayist had said appealed to him very strongly. He counseled extreme conservatism in regard to the removal of the ovaries, and said he thought the tendency of gynecologists to-day was inclining more and more toward conservative operations. This, however, had not been the thing in the past. To remove organs in the pelvis or elsewhere simply because they might in the future become diseased or cause trouble to some of the neighboring organs was not only unjustifiable, but unreasonable, in his judgment.

Dr. Rufus B. Hall thought he had not been clearly understood with reference to the removal of ovaries and tubes in cases of gonorrheal infection. If it was possible in cases of gonorrheal infection with double pus tubes to save the ovaries, he did so. In many cases one side was likely to be more diseased or in a worse condition than the other, and one might have to sacrifice one ovary as well as a tube on that side. The opposite ovary, if it was not infected, should be saved. The tube should be removed down to the uterine end and covered with the peritoneum of the uterus, so as to guard against an abscess on that side. The other side should be removed at the uterine end in the same way. He had operated on dozens of such cases, and not one returned for a second operation.

Dr. Whitbeck, in closing the discussion, did not disagree with Dr. Hall in regard to the treatment of the tubes. If he knew he had gonorrheal infection of the tube, one or both of them should be removed. He did not disagree with him in regard to the removal of ovaries. If one was no more afraid to operate a second

time than he was the first, and if he were just as willing to use his judgment and the fruits of his experience in a second operation as he was in the first, and have patients come back; if it was true conservatism to operate the first time; if it was true conservatism to leave anything, then it was true conservatism, if necessary, to operate a second or third time, and finally the patient would get well. If this matter could be left to the judgment of the surgeon, and he knew all there was about the case, it was safe, whether he operated once or twice or three times. If the patient left the question to the decision of the operator, who exercised his judgment, he might have to operate again, or he might not. He might find, though he had removed the uterus and adnexa, it necessary to operate again for some condition.

TRIVIAL PATHOLOGIC CONDITIONS OF THE UTERUS AND ADNEXA CONSIDERED AS CAUSES OF SEVERE GASTRIC DISTURBANCES.

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Few classes of disease exemplify the necessity of a wide and mature consideration more than those implicating the female sexual organs, no matter how vague the clinical picture may be nor how trivially the pathological conditions may present themselves.

That a gynecologic affection of so wide a nature as to cause little or no local disturbance may excite in remote organs symptoms of alarming severity, has been a matter upon which opinions have been expressed in many diverse ways.

In presenting this subject, one of extraordinary interest to the gynecologist and neurologist, I was prompted by rather trying experiences that fell to my lot in an endeavor to relieve continued gastric distress in a number of patients that consulted me.

It is often a difficult matter to obtain a satisfactory history when a patient is of a very neurotic temperament and not seriously sick. This has been the case with nearly all of these patients whose disorders seemingly centered in the epigastric region.

During the last two years eight patients came under my ob-

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servation, six of whom presented a train of symptoms that would ordinarily be grouped as those of hysteria or neurasthenia, moderately severe in character. The remaining two patients were free from any such pronounced neuropathic phenomena, and seemed in fairly good health with the exception, as they stated, that their stomachs were very weak.

I will not burden you with histories in detail. They would be too lengthy, and their significance would carry but little weight. Aside from the symptom finesse that we invariably find in cases of neurasthenia and hysteria, the symptom of contention in these women was persistent nausea or vomiting, with almost constant pain in the epigastric region. Excepting some difference in the degree of irritability, depression, exhaustion and emaciation, these patients presented a clinical picture of considerable sameness. Nausea or vomiting would appear without any apparent cause. At times the odor from cooked food (mostly meats or soups), would bring on a violent attack. Sometimes a walk to the point of gentle fatigue would start distressing symptoms. Similarly, reading or talking to a friend would at different times cause vomiting. Meal hours would affect the nausea or vomiting very little. The paroxysms seemed to be more frequent, however, after eating. Three of the patients had long intervals of rest and vomited very little for days. During this period of rest, however, painful eructations would take the place of vomiting.

The menstrual molimen aggravated the nausea and vomiting in all these patients, while three complained of much stomach distress after coitus. Two patients stated that they would suddenly awaken at night and begin to vomit.

From what I could discern there was never any stated periodicity as to when an attack of vomiting would be most apt to take place. It was never any effort on part of the patient to vomit. A feeling of exhaustion usually followed even a mild paroxysm. The vomitus consisted principally of mucus, often having an admixture of bile. If food or water had been taken shortly before, the whole would be usually found in the vomitus.

The ages of these eight patients ranged from 19 years to 42 years. Six were married, five of the six having given birth. No serious illness during last five years. General health was usually good. Food was always taken with a relish. The natural functions were normal excepting some slight menstrual irregularity. There was an obstinacy of the bowel in all, although at times the stools of some were diarrheal in nature. All these patients experi-

enced aches and pains about the back at some time or other, to which they gave but little attention. In stature all were of medium height excepting a blonde woman, who was very tall. With the exception of this patient the remaining seven were either partial or pronounced brunettes.

The longest period of their present disorder dated back about four and a half years, the shortest period about twenty-six months. The intellectuality of these women was above the average. Few had been without medical attendance for any length of time. Two had been operated on for gallstone disease, movable kidney and gastric ulcer, the cicatrices bearing evidence to this fact.

Christian Science claimed four patients for several months, at first with an appreciable improvement; eventually the condition, however, lapsed into its former state. The improvement while under therapeutic measures, including lavage, was at no time encouraging. All patients had been examined for a possible affection of their pelvic organs, although no distinct symptoms presaged a local disorder. In each case the examination was pronounced negative, as what was found was not regarded of sufficient import to be given any further attention.

A physical examination of these patients as they came under my care revealed no appreciable organic disorder. It was imimpossible to diagnosticate a diseased condition of the stomach or any of the organs in the abdomen above the umbilical line.

The pelvic organs, however, upon a thorough examination, gave evidence of disease, and although the examination did not reveal anything of a serious nature, yet the character of the affection appeared sufficiently severe when the condition of the patient, together with the negative results of all treatment, was taken into consideration, that these conditions seemed a possible contributory cause of the existing gastric disturbance.

In all patients the examination caused pain. The pathologic findings were as follows:

Case I.—Extensive bilateral cervix and perineal laceration. Uterus retroverted and flexed and bound down by adhesion.

Case II.—Not married. Marked hypertrophy of portio vaginalis of uterus. Uterus very hard and retroverted. Prolapse of right ovary. This patient fourteen months ago was operated on for movable kidney (right). No improvement in her condition. Four months later she was again subjected to an operation, this time for gallstone disease. No improvement followed.

Case III.—Examination very painful. Small cyst of left

ovary can be readily palpated. Uterus retrodeviated, and adhesions.

Case IV.—Large unilateral laceration of cervix involving vaginal wall. Uterus retroverted, fixed. This patient was operated upon for supposed gastric ulcer eighteen months after having been taken with vomiting.

Case V.—Examination very painful. Small mass can be recognized behind and to right of uterus. Organ retroverted.

Case VI.—Extensive perineal tear, marked prolapse of vaginal wall. Uterus large and retroflexed. Movable.

Case VII.—Uterus large, retroverted, movable, painful to touch. Both tubes thickened. Palpation causes pain.

Case VIII.—Large bilateral cervical tear. Uterus retroverted and adhesions. Palpation of ovarian region painful.

Whatever the influence of these disorders upon the nervous system of a woman might be, their findings were sufficiently pathological to demand correction. We have here a series of pelvic affections that have caused little or no discomfort, at least not enough to call attention to those parts. It must be borne in mind, however, that time is a great eliminator, and that unquestionably in the earlier stages some pain must have been experienced. A woman's constitution is such that often owing to continued suffering she becomes so accustomed to her aches and pains that they actually become a part of her existence, and unless such pains grow more in their severity, much of the distress is forgotten.

In the enumeration of the above cited cases, we find in each patient a distinct gynecologic disease that had existed for years. Simply because these patients did not suffer from pain owing to these supposedly trivial conditions were left to be taken care of by the economy as well as such an organism can without help.

We are familiar with the delicacy of the nervous system a woman is endowed with, and we understand the potent influence the genital system exerts upon the feminine mind. I may state here that the external genitals of the female are supplied by both spinal and sympathetic nerves, while the internal genitals—uterus, ovaries and tubes—are supplied by the sympathetic alone. There exists a very intimate connection between these two systems. We have the interrelations of the uterine nerves which supply the posterior wall of the uterus and belong to the sympathetic system (plexus hypogastricus interior, plexus spermaticus and plexus uterovaginalis), directly established through the solar ganglion or plexus celiacus. Uterine stimuli

are transmitted through the solar plexus to the plexus gastricus anterior of the stomach. The plexus gastricus anterior is formed by the left vagus, and in its cervical portion gives origin to the ramus meningens. Irritation of this nerve causes vomiting. From the interlacing of these two nervous systems it is not difficult to understand how a morbid state of one organ, although not in itself sufficiently diseased to create symptoms whereby attention would be called directly to such an organ, can produce disturbances of a severe nature in distant organs.

The clinical picture as presented by these patients was that of a reflex neurosis. In some the nervous phenomena, as it manifested itself, was distinctly neurasthenic, in others it was hysterical.

If I do not err, the scientific characteristics of neurasthenia and hysteria are such that these affections are now regarded as well defined diseases. I cannot refrain, however, from remarking that the more I meet with disturbances of such a nature, the more firm do I become in my belief that an organic trouble is responsible for them.

A question of paramount value with such affections is this: Has the gynecologic disease been primary, and subsequently caused the neurasthenia or hysteria to develop, or has the neurasthenia or hysteria been latent in the system and brought into evidence by a gynecologic disease? The solution of this question can probably be only accidental.

Reverting to the foregoing cases, we find that all rational treatment proved ineffective. The only avenue of treatment remaining was through a surgical procedure.

With the necessary operative steps to correct the existing pathological condition we hoped to either mitigate or cure the reflex neurosis. Operation was proposed and accepted by five out of the eight patients.

An abdominal section in each case was the operation of choice, because a thorough inspection of the pelvic organs and abdominal cavity was desired. Operative findings and procedure for correction:

Case I.—Uterus retroverted and flexed; firmly bound down by adhesions. Omental adhesions to uterus, left tube and ovary. Both ovaries cystic. Uterus was freed. Ventral suspension. Both ovaries resected. Perineum and cervix had been previously repaired.

Case II.—Not married. This patient was operated on for movable kidney fourteen months ago, and gallstone disease ten

months ago. Uterus retroverted and adherent. Very hard. Right ovary cystic and prolapsed. Right tube inflamed and thickened. Uterus freed, suspended. Right ovary and tube removed. Elongated vaginal portion of uterus partially resected.

Case III.—Uterus retroflexed, and bound down by firm adhesions. Extensive omental adhesions to uterus and right tube. Cyst of left ovary, size of hen's egg. Uterus freed and suspended. Omentum resected. Left ovary removed.

Case IV.—This patient underwent an operation for gastric ulcer eighteen months ago. Uterus retroflexed, firmly bound down with adhesions. Hydrosalpinx of both tubes. Intestinal (ileum) adhesions to left tube. Appendix adherent to right ovary. Uterus freed and suspended. Adherent ileum relieved. Appendix and both tubes removed. Cervix laceration had been previously repaired.

Case V.—Uterus enlarged and retroverted. Fibroid almost the size of a walnut in posterior wall. Both tubes inflamed. Uterus and both tubes removed.

With the exception of Case II all the patients were relieved of nausea and vomiting from four to eight weeks after the operation. Case II showed much improvement when she left the hospital. There remained, however, considerable gastric disturbance. Eight months later her condition was very good, with only occasional attacks of vomiting (pessary).*

In all these patients the nervous manifestations (reflex-neuroses), began to gradually subside, and a return to health, or rather a normal state, was established within six months in all cases excepting Cases II and IV.

Unfortunately death by pneumonia (right) resulted in Case IV. This patient, after giving every evidence of great improvement in her condition, was chilled by a sudden storm coming up at night while she was still in the hospital. A pneumonia developed, and she died on the fifth day, three weeks after operation.

To approach a patient with the suggestion of an abdominal operation for the relief of a condition that gives but a vague evidence of its true character, without being able to offer anything positive to the patient, requires a great deal of moral fortitude. The gravity of such a procedure is felt very keenly, both by surgeon and patient.

In the cases thus cited it was a surgical procedure that anticipated pathological conditions. To wait for pathological con-

* In this case the necessity of a pessary became apparent on account of the failure to properly suspend the uterus.

ditions to give evidence of their existence by more pronounced local symptoms in gynecologic disease where there is a marked reflex neurosis, would be to invite secondary conditions that might prove of a very grave nature.

4629 Cooke Avenue.

DISCUSSION.

Dr. Rufus B. Hall differed with the essayist in this respect, that some of the cases reported had pathological conditions sufficiently marked to justify operation without any reference to the neurotic condition present. The point he wished to make was that these patients were so crippled by the pathological condition as to have justified operation, even though the operation did not or would not correct the nervous element in the case. It was one straw off the camel's back, so to speak, towards relieving the patient. To cure these nervous patients it was necessary to remove every obstacle in the way of perfect physical health. He was convinced that many of these cases, if left alone, would have become worse, more grave pathology would have resulted later, it would have been more difficult surgery, and harder for the patients to have recovered after operation.

Dr. X. O. Werder of Pittsburg, Pa., was not enthusiastic about operations on neurotic patients, as the results usually were not very good. He was afraid the essayist would find in some of these cases in a few months a return of the same symptoms. Of course, operation was indicated.

There was one procedure that might be criticised, and that was ventrosuspension. He believed the day of suspension was passed, and that gynecologists ought to find some other method of relieving displaced uteri.

Dr. Reder, in closing the discussion, said there was a misunderstanding in reference to the case of suspension of the uterus. This operation was performed by an assistant. The patient bore the anesthetic badly; she had a chronic metritic uterus, where the sutures readily tore out, and several attempts were made to tie the sutures in the friable uterine tissue. They did the best they could. After the operation the patient was restless, and the sutures in the uterine tissue allowed the uterus to fall back so that later a pessary was introduced.

Speaking of trivial pathological conditions, he had reference to those manifestations which presented themselves when patients came under observation. There were no local symptoms, no disturbance, no so-called pelvic disease, and vaginal examination revealed that the conditions present were only to be considered of a trivial nature, but later on, when an abdominal section was made, aggravated conditions manifested themselves.

As to methods of holding the uterus in position, he thought the only means we had at present where a uterus was bound down by adhesions was to loosen those adhesions thoroughly and secure the uterus by ventrosuspension. It was better, in his judgment, to suspend the uterus than to fix it, so as to give it a certain

amount of mobility. The pessary was valuable, but it was only useful in cases where one found a retroverted uterus that was mobile. The only pessary he had come to use was a heavy round ring, which acted as a support to the adnexa and at the same time supported the uterus.

THE TREATMENT OF PROLAPSUS UTERI.

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(With five illustrations.)

PROLAPSUS uteri shows itself in different degrees of severity, and has been arbitrarily divided into different classes, according to the degree of decensus. It is obvious, however, to all of us, that the condition—no matter what degree—is the result of the same pathological processes, and its treatment must be accomplished by the same measures; and these only differ in degree from simple plastic surgery of the vagina and perineum, with or without vaginal hysterectomy or hysterorrhaphy, to the most difficult, complex and elaborate surgery for the cure of pelvic hernia.

It is usually slow in its development, and, as a rule, is the result of a previously ruptured and unrepaired perineum, together with such relaxation of the soft parts as would be consequent upon a breach in the pelvic floor, and increased by frequent childbearing, lifting of heavy weights, straining at stool, or any other form of intraabdominal pressure—particularly when the direction of this force is upon the upper and anterior surface of the uterus, as is the case with a retroposed uterus, so often the antecedent of prolapsus uteri. It is occasionally acute in its onset, and may be seen even in the nulliparous woman, when it is the result of some severe fall or violence which pushes the uterine body down into and through the introitus vaginæ. It would be accompanied by painful and perhaps very dangerous and distressing symptoms, due to the traumatism; but, just as soon as the acute trouble subsided, the subsequent history and treatment would be similar to the more gradually developed cases.

The various methods of treatment which are employed must

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depend upon the degree of prolapsus, the age and social condition of the patient, whether the woman has borne children, and perhaps has a large family and is the wage-earner of her family. Tentative measures, such as tampons, balls and pessaries, can accomplish but little with this distressing condition, and, therefore, surgical interference alone promises relief.

Minor degrees of prolapse can often be cured by bringing the retrodisplaced uterus forward by an Alexander operation, and then performing an anterior and posterior colporrhaphy and perineorrhaphy. These operations hold the uterus forward and upward and give the broad ligaments a chance to retract. The round ligaments have but little power to lift the uterus upward—they simply pull it forward, while the plastic operations narrow the vaginal canal and further support and elevate the uterus.

When the uterus presents at the introitus, or the cervix comes into the world, a vaginal hysterectomy with anterior and posterior colporrhaphy and perineorrhaphy is indicated, or a ventral fixation with the same plastic surgery of the vagina. In either case, if the cervix be elongated or torn, it is best to remove it by amputation, because we thus remove the wedge which dilates and pushes downward the soft parts. For the past three years I have been removing the uterus per vaginam as the operation of choice, because three cases failed in which I ventrofixated the organ after having done at the same time the plastic work in the vagina; and in all of these cases the body of the uterus remained firmly attached to the abdominal wall, while the cervix pointed into the world with cystocele and rectocele due to a giving away and stretching of the tissues at the neck —in other words, a supravaginal elongation of the cervix took place, which permitted the prolapsus of the cervix and soft parts below. In two of these patients I subsequently removed the organ per vaginam, and then took up the cystocele and rectocele and sewed the vault of the vagina to the stumps of the broad ligament with a perfect and lasting success.

The other case fell into the hands of Dr. Howard Kelly, who removed the uterus per vaginam and closed up the vagina intentionally so that future intercourse was impossible. The result, so far as the prolapsus is concerned, is most satisfactory, but I have now in contemplation the opening of the vagina so that she and her husband can enjoy their marital rights. I am satisfied any procedure which robs a woman of her con-

nubial happiness is not often necessary, nor will she tolerate such surgery, and therefore it should be undertaken only after every other means had failed, because it brings with it so much domestic unhappiness; not only is the husband compelled to lead a life of sexual abstinence, but the wife, by being the cause of this forced restraint, broods over her condition and becomes depressed, hypochondriacal and even suicidal.

There are many other objections to fastening the uterus on to the abdominal wall. The patients often suffer from frequent hemorrhages, pain and tenderness in the scar and lower abdominal region, irritable bladder, etc., etc. Occasionally the bladder and rectum will prolapse after the uterus has been removed, but I am satisfied this is more often the result of poor plastic surgery on the anterior and posterior vaginal walls. The split edges of the obturator fascia with the levator ani muscle were not carefully fished out and brought together and retained in apposition by a special layer of chromic gut sutures, and unless this is carefully done failure is inevitable.

Operations for cystocele, whether associated with a prolapsed uterus or not, are not so uniformly successful in my hands as the operation of posterior colporrhaphy and perineorrhaphy when done for a rectocele, and I am sure it is because in many cases the anterior fascia is not torn in the median line, but laterally along the rami of the pubes and ischium, and therefore cannot be found through the ordinary diamond-shaped cystocele denudation or by the Stolz operation, and the fascia is, therefore, not picked up and brought together as it can be in the perineal operation with the finger in the rectum to differentiate the fascia and levator ani muscle. Fortunately, a slight giving away of the anterior wall is not so serious if the perineum and posterior vaginal wall be permanently fixed, because the cystocele cannot recur to any degree, as the fixed perineum will prevent its descent.

Sometimes the procidentia is extreme, so that the uterus and vagina fall down between the legs, even to the knees, and the contents of the sac consist not only of rectum and bladder, but also of coils of the small intestine. In one such extreme case upon which I operated successfully two years ago, I sewed the narrowed vagina and broad ligament stumps into one firm piece and then quickly did an abdominal section and sewed the stump with kangaroo tendon to the abdominal wall, and the soft parts, bladder and rectum have remained in splendid position eve since. A few weeks ago I received a very interesting paper

from our distinguished member, Dr. Crile, of Cleveland, in which he described an elaborate operation for the cure of these extreme cases.

Dr. Polk, in a recent article in the *Medical Record* upon the treatment of procidentia uteri, claims that hysterectomy is not often indicated because it is too radical for the minor cases and not sufficient for the more serious ones. I must say this has not been my experience, and after having operated upon a great many cases of procidentia uteri, only once have I been compelled to adopt measures such as he and Crile recommend, and I am satisfied that these extensive operations will only be occasionally called for if more care and attention is given to the plastic surgery of the vagina and perineum. Indeed, it is not possible to do these operations except where great relaxation and redundancy of tissue exists.

I wish now to describe my operation for rectocele, which consists of a free posterior colporrhaphy and perineorrhaphy and the taking up of the pelvic fascia and levator ani muscle, where they are torn, and the sewing up of the various structures from above downward in the direction that these tears take during parturition.

We have here a section of the posterior wall of the relaxed and torn vagina with the cervix on top. A curved, sharp-pointed scissors is pushed into the junction of the skin of the perineum and the mucous membrane of the vagina, in front of the anus. The mucous membrane of the vagina is then freely separated from the skin and other structures, as far as the carunculæ or those points—one on each side—to which the perineum will be closed. Then this piece of separated mucous membrane is picked up with a pair of artery forceps and divided across with a scissors. A double incision is now made with angular scissors up the posterior central portion of the vaginal wall even to the cervix uteri, depending upon the amount of relaxation and flaccidity of the vagina, and a piece of mucous membrane, triangular in shape, is removed, from a half to one inch in width, according to the size of the vagina (Fig. 1). The finger is then passed high up into the rectum and pressure is made forward, and wherever there is a break in the pelvic floor the hard edges of the obturator fascia and levator ani muscle will be felt, when they are carefully brought together and sewed with fine chromacized gut. This sewing process is commenced high up in the vagina and is continued downward until the whole fascia and levator ani muscles are perfectly approximated.

The bulging rectum is turned in on itself and its lumen is lessened by taking the excess up with a few stitches of catgut. Then the vaginal mucous membrane is brought together by interrupted sutures to the introitus and the perineal edges of the wound with silkworm gut; the most anterior suture also takes in, not only the skin, but the lowest part of the opposed vaginal



Fig. 1. Diagram of Posterior Vaginal Wall Showing Denuded Area.

sides, which we may call the crown stitch. It will now be seen that we have lengthened the vagina and changed its horizontal course to an oblique one, and have made a strong, full perineal body, which any effort at coughing or straining will not displace. Moreover, in some cases where the perineum is very much relaxed and stretched out, not so much from the tearing

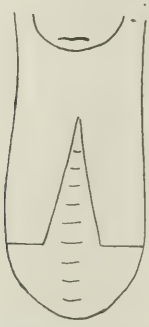


Fig. 2. Buried Sutures for Levator Ani and Obturator Fascia.

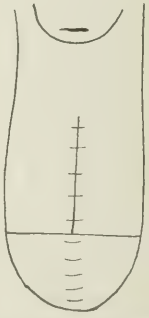


Fig. 3. Upper Part of Wound Brought into Position and Sutured

of the fascia and levator ani muscle as from simply the stretching of them. Here through this high and ample denudation which is provided in my operation, the loose fascia and muscle can be picked up and lapped on itself, and in this way the re-

laxed structures may be permanently fixed by the buried chromic gut sutures.

Previous to this operation I did the Emmet and was taught the operation by Dr. Mann, whom I assume does the classical operation as well as anybody else, since he was one of Emmet's pupils and house surgeons. I had so many failures with the operation as I did it, that I began doing this one, which I have gradually elaborated, and which has proved very successful in

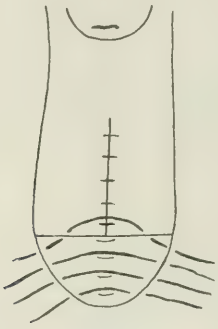


Fig. 4. Skin Sutures to Close Lower part of Wound and Perineum.

my hands, and with it I have cured other cases on which I failed by a previous Emmet or bat-wing denudation.

Its advantages are:

1. It brings up the fascia and levator ani muscle into perfect view, and their closure can be satisfactorily accomplished.

2. It removes the central and stretched-out portion of the vagina, and exposes by reason of the denudation the dilated and distended rectum, into which a few stitches of catgut can be placed, and thus tuck up or lap up the excess of rectal pouch.

3. It lengthens the vagina by converting a horizontal into an oblique canal.

4. It provides a thick permanent perineal body instead of a skin perineum, which so often results from other operations.

493 Delaware Avenue.

DISCUSSION.

Dr. Charles L. Bonifield had not seen a case where he thought vaginal hysterectomy was indicated in prolapse of the uterus. He might at some time, however, change his opinion in this regard. He would admit that on one or two occasions he had operated for recurrence of prolapse of the bladder. He had had one failure to relieve a prolapsed uterus, which occurred in the first class the

essayist referred to—that is, prolapse in an unmarried woman occurring from some severe muscular exertion. He thought it was very seldom, if ever, that we should do ventrofixation or suspension, but he believed that in prolapse of the uterus this measure was justifiable. It should not be done when we had an idea that the patient was to become pregnant, but in the case of a woman who had been damaged by labor, with her uterus hanging between her legs, who would never become pregnant again, we should make use of suspension of the uterus, if we thought it wise to do so. He did not believe the uterus could be expected to hold up the vagina, the bladder and the rectum. It was not something that we could tack everything else on and make the support from above take the place of the support from below. It was of the utmost importance to do vaginal work accurately and properly. He had never had, excepting in the one case he had referred to, prolapse of the uterus. He had never had the uterus stretch so as to not do its duty, so as to let the cervix protrude again, and he believed



Fig. 5. Section Showing Completed Operation and Sutures.

one of the reasons was because he had taken great care in doing vaginal work.

In regard to the operation for cystocele, he believed that the procedure recommended by Dr. I. S. Stone of Washington, D. C., in a paper read before the Cincinnati Academy of Medicine some years ago, in which he separates the bladder from the vaginal wall and attaches the vagina to a higher level on the uterus, was the most satisfactory procedure in cystocele that had been introduced, and it was one he employed invariably.

What he particularly wanted to speak about was the perineorrhaphy. The essayist had suggested, and he thought the president would take him to task for it, making the denudation in the median line. The speaker thought this was one of the weak points in the operation that had been described by Dr. Hayd. There were two objections he would make to Dr. Hayd's operation: (1) The form of denudation, and (2) introducing the finger into the rectum during the operation. Personally, he was afraid to do that when he buried a lot of catgut.

Dr. Hayd said that with his finger in the rectum he was naturally careful to bring together the perineal fascia and levator ani;

that his assistant tied the knots, so in that way he never touched the surface at all.

Dr. Bonifield replied that this explanation robbed his criticism of its force. He thought Dr. Hayd's method of closure was excellent, but he believed the Emmet operation was better, because it uncovered the vagina at the point where one wanted to sew it.

Dr. Rufus B. Hall thought the operation of Emmet, as suggested by the last speaker, was as satisfactory and more desirable than some of the other methods.

Dr. F. F. Simpson of Pittsburg, Pa., for many years did the Emmet operation, had seen it done, and was not perfectly satisfied with it, so that for years he had been doing practically the same operation that Dr. Hayd had described, and the results had been uniformly satisfactory.

The paper was further discussed by Drs. Francis Reder, Oscar H. Elbrecht, Howard W. Longyear, and the discussion closed by the essayist. The remarks were accompanied by blackboard demonstrations, each one bringing out little points of difference in technique.

LIVER SURGERY.

BY

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(With one illustration.)

That surgery of the liver has not progressed so rapidly and satisfactorily as surgery of the other abdominal organs is due to the fact that certain obstacles had first to be overcome and certain problems solved. These problems may be classed under four headings, namely:

1. The control of hemorrhage.
2. The power of the liver to regenerate itself.
3. Infection.
4. Cholemia.

The control of hemorrhage has always been considered a difficult matter, and various means for its accomplishment have been advanced from time to time. One of the earliest, and under many conditions the only method that can be employed is tamponade. Grekow[1] advocated it whenever the liver could not be brought into plain sight, or when the wound was very deep, and he also advised that the tampon should be removed a little

at a time in order to avoid secondary hemorrhage and the risk of infection. Tricomi[2] says gunshot or other deep wounds require tamponade. Garwardine[3] reports a case in which the liver was lacerated across the entire under surface from the position of the gall bladder to the posterior part, with a crush of the rest of the right lobe. Three and three-quarter yards of iodoform gauze packing was used, and in addition a large amount was packed under the left lobe, with recovery. Wilms[4] cites a case in which the entire left lobe was crushed off where he used immense numbers of pieces of gauze between the liver, diaphragm, stomach and spleen, so that with partial closure of the wound the entire mass of tampon was pressed against the spinal column. Healing was uncomplicated. The friability of the liver has prevented the use of suture and ligature until recent times. Kussnezoff and Pensky[5] advocated the ligation en masse by the passage of deep intrahepatic ligatures, employing a double thread with blunt needles, and passing the ligatures in and out of the liver substance, cutting alternately above and below and tying. They showed that the individual vessels of the liver can be successfully ligated, and that the isolated hepatic veins are stronger than the arteries. In addition, foreign bodies have been employed from time to time, such as fish bone, whale bone and ebony, which were left to become encapsulated.

Recently Payr and Martin[6] made a number of experiments with magnesium plates. They claim for them several advantages over other foreign bodies. They completely control hemorrhage, there is no risk of peritonitis, and what they lay particular stress upon is that adhesions are quickly formed while the magnesium plates, through the action of the hydrogen and oxygen of the tissues, rapidly disintegrate so that at the end of from three to four weeks all there is to be seen at the line of suture is a white elevated scar. To prevent adhesions to the neighboring organs the line of suture is covered with omentum.

Carl Beck[7] in the place of a foreign body employs bands of tissue from the abdominal wall to support his sutures. J. Frank[8] has recently described a method of suture which he claims controls hemorrhage easily and at the same time reestablishes the continuity of the liver substance, leaving no raw edges. He incises the liver in such a manner as to remove a wedge-shaped piece, and leaves the organ with two flaps forming a trough. All vessels are secured either by single ligature, or by ligature en masse, and any slight oozing is controlled by pressure or superficial suture. The flaps are then coaptated, and with a long

non-cutting needle, threaded with medium catgut, he sews through the liver with a running suture, sewing first through the bottom of the trough and then superficially until the wound is closed. He no doubt secures by this means very excellent hemostasis, which is to be accounted for as Dr. Crile has explained, by the fact that the portal blood pressure is quite low, and inasmuch as the hemorrhage is mostly venous, the good coaptation secured by this method makes the slight but evenly distributed pressure quite sufficient.

As for the suture material, catgut, threaded on a rounded non-cutting needle is perhaps most generally employed. Besides tamponading and suturing, either separately or together, various other means of controlling hemorrhage have been used, such as the elastic ligature for the temporary stoppage of bleeding, or for the purpose of constricting a growth until strangulation occurs. Keen[9] used this method in one of his cases with success. Israel[10] and others have employed it. The Paquelin cautery which was advised by Lucke and Tillman[11] has many advocates at the present time, but is mainly employed in conjunction with other methods. Tricomi[12] used adrenalin chloride on animals, and says that one application will sometimes control bleeding, and that subsequent dilatation of vessels and hemorrhage is not to be feared.

Freeman[13] says parenchymatous injection of adrenalin chloride is good only for small vessels. From this and other observations it would seem that adrenalin chloride is not greatly to be depended upon for control of hepatic hemorrhage of any magnitude.

The foregoing seem to be about all the methods as yet employed to combat hemorrhage of the liver, and the best, at least theoretically, unless large bloodvessels be incised, would seem to be that described by Dr. Franc in an August number of the *Journal of the American Med. Association*. In addition to these noted I wish to call your attention to a means of controlling liver hemorrhage in certain cases of severe bleeding when the bloodvessels cannot be easily reached. It sometimes happens that to tie them requires a further enlargement of the lacerated liver substance—this of itself increasing the gravity of the patient's condition.

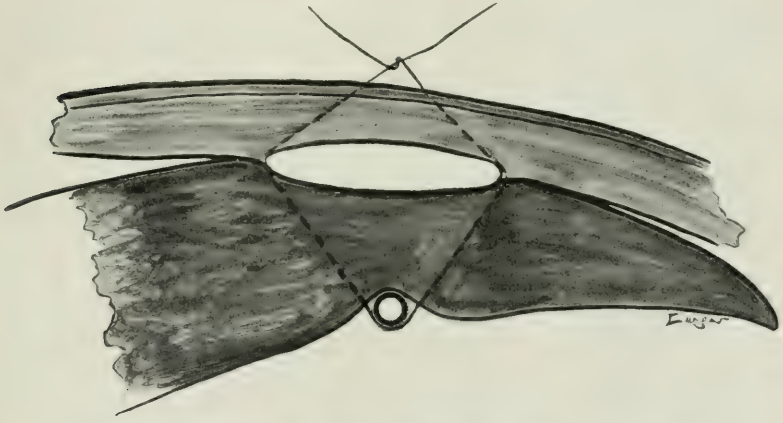
Three years since my friend, Dr. Hartman, of Wauseon, Ohio, called me in haste to see a young girl of fourteen years who had been shot by a target gun, the bullet entering between the eighth and ninth ribs near the costal cartilages and passing through the right lobe of the liver, lodging behind the stomach. The low

velocity of the bullet had caused it to make a tear rather than a perforation. When first seen the child was nearly pulseless and had all the evidence of a severe internal hemorrhage; her face and lips were white and bloodless. The abdomen, with the assistance of Drs. H. L. Green, Hartman and Wilkins, was opened at once.

An incision was made close and parallel to the costal cartilages on the right side. The abdomen was found full of blood, which could be seen freely oozing from the torn liver. I attempted to control this, first with catgut ligatures, but the friability of the tissues prevented. Some time previously I had an experience with a similar wound of the liver made by a bullet, and had attempted to control the hemorrhage by packing with gauze; but the patient, a strong, robust man, had promptly died from the continued loss of blood. Post mortem revealed that the gauze packing had been entirely inadequate to control it. Having this case in mind, I did not feel like trusting again to gauze, and inasmuch as it was not controlled by direct ligation, it occurred to me that by passing sutures from within, entirely through the liver substance and through the abdominal wall, making exit between the ribs after the manner of a staple, and tied firmly on the cutaneous surface, that permanent and constant pressure could be made, sufficient to control the hemorrhage without the ligature cutting into the friable liver tissue. Five or six such sutures were now introduced on the proximal side of the wound, each one embracing about three-quarters of an inch of the liver substance. Care was taken to link them together so as to include all the bleeding tissues in their bite. The ligatures emerged between the ribs the same distance apart as they were entered on the liver surface, and when firmly tied all the hemorrhage and oozing ceased at once. Other injuries to the viscera, which were slight, were repaired, a drainage tube inserted, and the abdomen closed. The patient made an uninterrupted recovery, though this was hardly deemed possible by the physicians present. I have since used this suture in two instances, in one of which, in removing a very adherent gall bladder, I met with a severe hemorrhage which was readily controlled with it. Recovery was prompt.

The third case was one in which a hydatid cyst, the size of a small cocoanut, was removed, together with a large number of gallstones from a suppurating gall bladder. This patient unfortunately died from peritonitis, a few days later, but the hemostasis was perfect. The stitches, however, were found at post mortem, to have slightly cut into the liver substance, but not sufficiently to

interfere with their efficiency. Recently I have had some experiments made upon dogs with the idea of overcoming this defect of ligature cutting, and find that by the use of a flexible rod, such as a rubber tube drawn over a linen catheter No. 10, placed against the liver along the proposed line of suture, and passing the sutures over it this trouble is largely overcome. Sufficient pressure is thus obtained to control hemorrhage from almost any portion of the liver without cutting into its substance. One end of the rod is left in the abdominal incision that it may be withdrawn when its presence is no longer necessary. This method of controlling hemorrhage seems to me to be well adapted to that class of cases where the large blood vessels are involved, and when the nature of the liver injury is such that it is only with difficulty the bleeding vessels can be reached. I would not



Suture for Controlling Hemorrhage from Laceration of Liver.

hesitate to pass the ligatures through the thoracic cavity if occasion demanded. Packing with gauze is no doubt useful in slight hemorrhages, but in my experience, when of any magnitude it cannot be relied upon. I am convinced that any method yet advocated will occasionally fail us; and for this reason I have presented this procedure to you for your consideration. On inquiry, the probable permanent fixation of the liver to the abdominal wall in the cases mentioned has been attended with no discomfort.

That the liver has marked powers of regeneration has been proven experimentally and clinically. Ponfick[14] and Meister[15] showed on lower animals, that three-quarters of the liver could be removed and the tissue restored by compensatory hyper-

trophy and hyperplasia. According to Keen[16] and Wilms[17], the left lobe has been entirely removed with no bad results following.

The dangers of infection following operations have become less and less as our technique has improved. Where pus exists, drainage by means of gauze and various kinds of tubes provide effectually against peritoneal contamination. Furthermore, bile is aseptic, and even should it gain entrance to the abdominal cavity will not produce unfavorable complications. This was shown very clearly by some experiments of Ehrhardt.[18] In twelve animals he divided the common duct near the duodenum and allowed the bile to flow freely from the hepatic end, having sutured the duodenal end to avoid infection. The fluid was sterile in every instance, and in no case was there peritonitis.

Other observers have found the same to be true clinically. This fact is well illustrated by a case coming under my own observation. A young man, the victim of a railroad injury, soon after developed a large quantity of fluid in the peritoneal cavity. The trocar showed it to be almost pure bile. It was drawn away a number of times, when it ceased to appear. About three weeks after the injury, in getting out of bed, he slipped and fell; death followed in a few hours. Post mortem revealed a partially healed tear on the under surface of the liver, which had again been torn open by his fall, with fatal hemorrhage. The bile that had escaped from the primary injury into the abdominal cavity had produced no peritonitis or any constitutional disturbance of note. Though bile may thus freely escape into the peritoneal cavity without danger, it is of common observation that it is far otherwise when it finds its way into the circulation or is retained in the tissues. Ehrhardt, in the same set of experiments mentioned above, found that his dogs died in from two to six days. The tissues were saturated with bile, while the thoracic duct was distended with it to its subclavian end.

It is of interest to note that by introducing some mild infective agent, such as a pure culture of bacterium coli into animals whose gall bladders were at the same time snipped open, that while many died, two recovered, and in these two he found bile stained fluid encysted within the peritoneal cavity, which was evidently not absorbed on account of the thin layer of fibrin which covered over everything. This coincides with what Davis reported before this society at its meeting in Indianapolis, in 1899. In a case of gunshot wound in which there was a large quantity of bile encapsulated in the peritoneal cavity,

the patient made a recovery after repeated tappings. Ehrhardt found his dogs all went well until these adhesions were broken down, when they promptly died.

The conditions of the liver requiring surgical intervention are rather numerous; traumatism, is no doubt the most frequent. Tilton[19] says the liver is more often injured than any other solid abdominal viscus, inasmuch as it lies wedged between the vertebral column and the ribs. It is heavy, inelastic, and very slightly movable.

A history of injury in the right hypochondrium, with symptoms of shock, internal hemorrhage, and muscle rigidity, points to injury of the liver. Pain, radiating to the right shoulder, with gradual increase on pressure is ofttimes present. Lack of mobility of the right chest may lead the surgeon astray, pointing to intrathoracic trouble. Wiggin[20] believes that delayed vomit or stool, in abdominal injuries, is indicative of rupture of the liver with no laceration of its coverings; the blood being forced into the hepatic duct and then into the duodenum.

Tilton (see above) finds that the prognosis is better in gunshot wounds and stabs, than in subcutaneous rupture, providing no other organ is injured. In twenty-five cases, eleven died, or 44 per cent.; twenty were operated early with mortality of 40 per cent.; ruptures operated, mortality was 62½ per cent. Stabs operated, mortality 33½ per cent.; gunshot wounds operated, mortality 28½ per cent. Thöle collected 399 cases of liver wounds treated by operation. Expectant treatment formerly gave mortality of 66 per cent.; while operation now gives 39 per cent. He says the present tendency is to operate in every case when signs of muscle rigidity are present, and advises in open wounds to enlarge and explore to find the extent of the injury. In subcutaneous injury, he thinks the expectant plan is justifiable where no marked muscle rigidity exists, no dulness in the right iliac fossa, no increasing abdominal pain, even if the nature of the injury does point to some degree of laceration.

Three methods of exposing the liver in trauma are mentioned. (1) Micheli makes two incisions, from the lower border of the fifth rib converging downward to meet at a point two inches below the costal margin; from there a single incision is continued downward as far as necessary. One of these starts from the parasternal line, the other in the anterior axillary line. Underlying ribs are resected, and the peritoneum, pleura, and diaphragm are incised.

(2) Guidone makes an incision starting from the upper border of the seventh cartilage, which is carried downward to the costal margin, and from this point a transverse incision is made upward to the tenth intercostal space; this incision respects the pleura and diaphragm.

(3) Martinelli makes a vertical incision, commencing a finger's breadth from the right ensiform cartilage and extending downward. Second incision commences at the upper end of the first and follows the costal margin. A triangular muscular cutaneous flap is drawn downward and outward while the ribs are elevated upward. In this manner a good view is obtained of the left lobe of the liver, and a part of the anterior and superior surface of the right.

Liver abscess is of interest to us in connection with our island possessions, and it should be looked for in patients coming from those parts, as records of two years from Manila, First Reserve Hospital, and from the Army Hospital of San Francisco, show liver abscesses in five per cent. of the cases. T. L. Rhoads[20] says the majority of the cases give a history of a previous attack of dysentery, but its absence should not be misleading. Seventy to eighty per cent. of all abscesses are in the right lobe, as the right branch of the portal vein is the shorter, wider, and more direct route for the blood, and as a consequence in the majority of instances, liver dullness is increased either up toward the nipple or down below the costal margin. Occasionally, when the left lobe is involved, this enlargement is down towards the spleen. Patients complain rather more of dragging sensation over the liver than of pain, though pain may be present, short and stabbing on deep inspiration. In about half the cases there will be a rise in temperature of two degrees toward evening. Patients have a sense of chilliness, though actual chills are rare. The pulse will reach 90 to 100 in the evening, but if a mixed infection is present, the pulse and temperature range higher. The leucocyte count varies between 12,000 and 40,000. Osler has recently reported three cases in which there was no leucocytosis. There is an anemia of 1,000,000 to 1,500,000 red blood corpuscles with 60 to 80 per cent. hemoglobin. The *X*-ray may occasionally help if the abscess is superficial.

We may treat liver abscess after three methods.

First, immediate drainage.

Second, exposing the liver and allowing it to become adherent to the abdominal wall, opening twenty-four hours later.

Third, trocar and canula with syphon drainage. The English

seem to be the main exponents of the latter treatment. Manson[21] and Cantlie[22] report twenty-eight cases with four deaths which were treated after this manner.

In America I believe immediate drainage is generally employed, it being considered that waiting twenty-four to forty-eight hours for adhesions to form is wasting valuable time. In my own hands, however, I have met with best success by first incising the abdominal wall, and after thirty-six or forty-eight hours opening the abscess and draining. Treating with a trocar and canula carries grave danger of infection and hemorrhage with it, and in my opinion should not be employed.

Aspiration for the location of pus is advocated by some. Cantlie[23] warns against using the same needle for successive punctures, unless it be resterilized.

Elliott[24], after locating pus with a needle, removes the barrel and leaves the needle *in situ*, as a guide waiting for five or six days before completing the operation. Rhoads[25] makes no preliminary aspiration, but after opening into the peritoneal cavity, palpates the liver carefully for irregularities, adhesions, and a peculiar resisting, tense bogginess that he thinks is characteristic of pus, then opens.

Elliott (vide) gives three routes for operation.

1. Transpleural, anterior and posterior.
2. Subpleural, anterior.
3. Transperitoneal, anterior and posterior.

In choosing a route it is advisable to open at a point nearest the surface of the liver over the abscess where, after evacuation, the best drainage can be secured. Where the location of the abscess is not clear, it is advised to open the abdomen by the anterior transperitoneal method, as abscesses are oftenest in the right lobe and nearer the anterior than the posterior surface. If drainage cannot be satisfactorily carried out by this route, close up, and open elsewhere.

Rhoads[26] has at considerable length and in detail described methods for dealing with abscess.

TUMORS.

The liver is occasionally the seat of new growths which are in very many instances operable. Among the tumors which have been removed, have been carcinoma, angioma, syphiloma, cavernoma, endothelioma, angiofibroma, adenocystoma, cysts, ecchinococcus, and hydatid, and portions of the malformed lobes of the liver.

Thöle[26] reports 148 liver resections with an absolute mortality of 16.8 per cent., and a relative mortality of 6.08 per cent. Keene[27] appends a list of 76 cases of liver resection, in which the mortality was 14.9 per cent. The age varies between wide limits. The great majority of cases are in females, due chiefly, Keene thinks, to the tight clothing worn by women. He emphasizes the difficulty in diagnosis. Most of the cases which he tabulated in his paper were wrongly diagnosed. Both he and Thöle mention the frequency of an area of tympany between the tumor and liver, which is very misleading. Keene says that when a tumor falls and rises with respiration, it should lead us to suspect a connection with the liver. In addition to the presence of this tympanitic zone, Thöle emphasizes two other points. First, the uncertainty of stomach analysis, inasmuch as there is often absence of free hydrochloric acid and the presence of lactic acid in liver tumors as well as in stomach cancer. Second, the difficulty of differentiating between kidney and liver tumors.

Of the duration of life with these tumors, it of course varies considerably. Fourteen cases lasted less than one year, and others from that time to as high as 15 and 18 years. Cancer is said to have existed in one case for ten years, and cases of cancer were well two, three and seven years after operation. It is usually believed that only primary cancers should be attacked; if this teaching should finally be adopted operation for cancer of this organ would be of rare occurrence, for primary cancer of the liver is seldom seen. Various methods for the resection of the liver have been employed:

1. Intraperitoneal method, i. e., the stump after ligature is dropped into the peritoneal cavity.

2. Extraperitoneal, i. e., with the stump fastened into the wound. There are three extraperitoneal methods.

a. Liver containing the tumor is sutured to the abdominal wound and allowed to remain until firm adhesions form, and at a second operation the tumor is removed. (Not generally adopted.)

b. Liver is fastened to the wound by sutures, and surrounded by an elastic ligature, which remains until gangrene appears, when the mass is cut away. This method is objectionable owing to the grave danger of sepsis.

c. To secure the tumor to the wound and excise it.

Anschuets collected ninety-six cases of resection, seventy-five

of which recovered, and seventeen died from operation. These were tumors of all kinds.

Ten done by excision, tamponnade, and compression. One died.

Seven done by thermocautery. None died.

Six done by preliminary clamping and excision. Two died.

Twenty-five done by excision and deep ligature. Two died.

Twenty done by intrahepatic ligature and excision. Six died.

Twenty-four done by elastic ligature. Six died.

In resecting, the incision is best that exposes the tumor well and gives plenty of room. Ribs and cartilages should be resected if necessary. Freeman[28] says, when necessary, the suspensory ligament may be divided. In all of these operations the control of hemorrhage is the most serious consideration.

Thöle used a silver flexible probe to pass his ligatures in operations of this character. Keen prefers the Paquelin cautery for the removal of the tumor and at the same time to control the hemorrhage. The point should be at a dull red heat. He found that he could burn slowly through the tissue to the large vessels, which could be secured and ligated before they were severed. He prefers by all means the intraperitoneal method of treating the stump. Where possible he says make the stump in the form of flaps, and where that cannot be done, sear it well and wall off with gauze.

Warren[29] removed an adenocarcinoma of the liver with the Paquelin cautery and knife, with no hemorrhage. Wound was drained with gauze. Good recovery.

Freeman (vide) operated an adenocarcinoma, isolating the tumor first by means of deep intrahepatic ligatures of narrow folded gauze, which were tied very tightly to compress the liver without cutting it. Tumor was then removed by the knife with no bleeding. He had great difficulty, however, in removing the tapes, and advises hereafter that they either be drawn tight and clamped, or be tied with catgut. The patient made a good recovery, and was well sixteen months after operation.

Rome[30] removed a tubercular mass from the liver in a woman aged 42. Tumor occupied the lower right lobe of the liver. He outlined a wedge-shaped piece of the liver, including the tumor, by means of heavy catgut sutures, which were introduced on one side of the triangle, and going through the thickness of the lobe, were brought out on the opposite side and left untied, the wedge was then removed, cut surfaces immediately approximated, and the sutures tied. There was no hemorrhage. The wound was closed without drainage, and the patient, made a good recovery.

The diagnosis of gummata tumor masses of the liver is very difficult. The history is really the only diagnostic point of value, and even that is not at all reliable, as at least half of our patients deny infection. Cumston[31] says hepatic gumma may be mistaken for almost any disease the liver is heir to. An enlarged spleen may occasionally help in the diagnosis, as it does not occur in cancer. Neusser and Cabot says that decided and relative increase of lymphocytes and eosinophiles point to lues.

As to the advisability of operating for hepatic lues, the French and the German advise decidedly against it. Anschutz (32), says close up the wound and don't do anything, as Kl and Hg will cure. Cumston[31] reports three cases in which an exploratory operation was done.

CYSTS.

Kehr[32] says—Echinococcus are the cysts of most interest. They are usually single and in the right lobe, they change the shape of the liver only if near the periphery. They may cause all sorts of pressure symptoms, as the nearby organs or the large vessels are encroached upon. Kehr says never to do an exploratory puncture unless you are prepared to follow at once with an operation. He makes an incision over the tumor longitudinally, packs off its neighboring tissue, puts in a trocar and then incises. He then draws the sac well out of the wound and sews its edges to the peritoneal wall, when it is carefully cleansed and irrigated with salt solution and drained. He has operated twenty-five cases by this method and did not contaminate the peritoneum in any instance. The discharge of bile sometimes amounts to a quart a day. If this discharge persists for months, curretting or packing the external fistula may reestablish internal drainage. If it does not, there is some obstruction in the lower biliary tract, which must be removed with a second operation.

Multilocular echinococcus is less common, is almost always in the right lobe, and the bile and blood vessels are involved with the growth, which on section is white or green, and looks like a sponge.

The treatment is, of course, radical excision. No other treatment is of any avail. Auvray[33] was able to collect 31 cases of Actinomycosis. This condition may be either primary or secondary, the latter more common. The primary lesion is often in the cecum or appendix, and may involve the liver by continuity, directly, or spread through the retroperitoneal cellular tissue. Iodide

of potash is of no benefit and in six cases of operation in this series none recovered.

HEPATOPTOSIS.

Steele[34] collected something over one hundred cases of floating liver. He says there are two forms; total hepatoptosis, where the liver is dropped from its normal position, so that it touches the diaphragm only along the line of its posterior attachment; 2, antiversion, where the liver rotates on its transverse axis, so that the anterior edge is displaced downward, the upper surface keeping in contact with the diaphragm, and the anterior abdominal wall.

Faure[35] shows that the most powerful agent in retaining the liver in place is its attachment to the inferior venacava. The broad ligament that binds the liver to the diaphragm is the one most likely to give way.

Causes are tight lacing, weak extensible condition of the suspensory ligament, low intraabdominal tension, due to an atonic condition of the abdominal wall, injury, or heavy lifting.

Symptoms.—One of the most characteristic, according to Steele, is attacks of colic in the right hypochrondrium, with or without jaundice. In addition, there may be a feeling of weight in the liver region, intestinal indigestion, and a long train of nervous symptoms. The liver can be felt somewhere between the costal margin and the brim of the pelvis.

The best method of palpating the liver is that described by Glenard. The patient lies on his back with knees extended and shoulders raised; surgeon sits on the right side and grasps the right loin of the patient between the thumb and the fingers of the left hand, while with the right hand he presses the mass of intestines upward under the liver; with the hands in this position, the patient is instructed to take a deep inspiration, during this inspiration the thumb is made to slide from below upward and outward and from behind forward. The edge of the liver should pass the thumb.

Treatment.—Many are helped by abdominal bandage. Operation offers a radical cure where there is no general enteroptosis.

Methods.—Treves fixed the liver to the anterior abdominal wall by several rows of silk sutures, which are passed well under the gland.

Carsten's[36] reports a case in which he denuded the anterior wall of the liver and the anterior wall of the peritoneum, brought the two together and then brought forward the coronary ligament and stitched it to the upper angle of the wound. Patient improved much.

Depage[37] places the patient in the Trendelenburg position, replaces the liver, makes a six-inch incision parallel to and one inch below the free border of the ribs, and turns up the cut edge of peritoneum under the edge of liver and sutures the liver between the two layers of peritoneum, that is between the parietal peritoneum and its reflected edge.

HEPATOTOMY—LIVER DRAINAGE.

It is occasionally necessary to drain the liver directly on account of some obstruction in the ducts.

W. E. B. Davis[38] found that by making a fairly large incision in the right lobe of the liver and packing, he was able to relieve cholemia and to drain it. He employed this method where for some reason the obstruction could not be removed at the first operation, and found that it relieved toxic symptoms, reduced the enlarged gland and enabled the patient to sufficiently recover to undergo a more radical operation.

Deaver[39] claims that this procedure is of no advantage, as he has accidentally torn the liver in some cases, and failed to get drainage of any value.

Kehr[40] recently had a case in which the ductus choledochus was so firmly embedded in adhesions that drainage by that means was impossible, so he removed an eliptical piece from the under surface of the liver edge 6 cm. long, 3 cm. wide, 2 cm. deep, and bringing up the nearby duodenum, made an incision 6 cm. long in that, and sutured it directly to the liver incision. Wound closed without drainage. Patient made a good recovery and was discharged in a month. The result in this case is of much importance in dealing with cholemia.

CIRRHOSIS.

The surgical treatment of cirrhosis of the liver is distinctly a modern achievement in liver surgery.

Talma, of Utrecht, in 1895 was the first to recommend surgical interference in this disease, for the relief of the accompanying ascites.

Working on the theory that an insufficiency in the collateral circulation of the blood causes ascites, he proposed to open up new blood channels by bringing the portal system into close relationship with the systemic venous system.

He had noted on post mortem, in cases of cirrhosis with no

ascites, that vascular adhesions existed between the liver and parietal peritoneum, and concluded that a collateral circulation was established through these vascular adhesions, which relieved portal obstruction and thus prevented ascites, so he recommended operating to form new adhesions artificially.

But in operating to relieve ascites, other factors than hypertension of the portal vein have to be considered in the causation of this condition. Tubercular peritonitis is not infrequently present, and some believe that changes in the peritoneum contribute largely to the causation of ascites. In view of these facts it is well to take into account the condition of the peritoneum before doing any operating.

Cumston[41] says that the peritoneum must be vivacious and susceptible of giving rise to extensive adhesions in order to secure a favorable result. He even advises an exploratory operation to determine the condition of the peritoneum, and the nature of the liver lesion, if they cannot be determined otherwise.

The earlier the case is operated the better is the chance of success. The operation consists essentially in uniting the omentum to the parietal peritoneum with as broad an area as possible. The omentum and liver should be scarified by knife, rubbing with sponges, or with stiff brushes, and then should be united by interrupted silk sutures. Drainage should not be employed, owing to the danger of infection. Tapping will probably be necessary for several months after the operation, until the collateral circulation is established.

The best anesthetic in these cases is a local one, where possible, and where we can't use this, ether should be employed. A number of cases are recorded where deaths following the administration of chloroform have been found at post mortem to have been the subjects of fatty degeneration of the liver, and it is believed that there was a direct connection between them.

Prognosis varies, depending upon the nature of the case. The small atrophic liver offers the poorest prognosis, inasmuch as there is here the greatest damage to the liver cells. The mortality is given by Alexandre[42] as 41 per cent.

Hypertrophic cirrhosis where there is less damage to the liver cells, offers a considerable better prognosis. Alexandre, same as above, gives 70 per cent. cured, mortality 15 per cent.

Ascites associated with luetic liver, and with cardiac diseases should not be treated surgically, and would only tend to

discredit the Talma operation if it were employed in these affections.

In conclusion, I am convinced that with a knowledge that hemorrhage of the liver is easily controlled, and that the liver has the power of regeneration in great degree and with better control over infection than formerly, it only remains that we improve our present methods of dealing with the bile, so preventing cholemia, when the liver will be attacked surgically much more frequently than at present.

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DISCUSSION.

Dr. John Young Brown considered this one of the most important subjects in surgery. He limited his remarks to that portion of the paper which referred to the treatment of injuries of the liver. In dealing with conditions of this character, as in dealing with surgical conditions elsewhere, it was very essential that the surgeon should adjust his surgery to meet the conditions that confronted him. In order to discuss intelligently surgery of the liver it was necessary to classify the work.

His experience in work of this kind had been quite large, and he had found that he had had to deal practically with two varieties of injuries of the liver: (1) Those cases in which the vessels of the liver were so injured that the patient was practically moribund before he reached the operating table. (2) Then came the complicated cases, in which there was injury to the lungs, diaphragm or stomach, and other abdominal viscera. In addition, we had open and subcutaneous wounds of the liver. He cited a case of gunshot wounds of the liver illustrating an open and a complicated wound. This was the case of an Italian, admitted to the St. Louis Hospital, who had been shot side to side, through and through, and was suffering greatly from shock. The speaker immediately opened the abdomen, the patient having been prepared on the table, and found two gunshot wounds of the stomach, two perforations, a gunshot wound of the gall-bladder, the gall-bladder being penetrated through and through, and a wound in the right lobe of the liver. This, he thought, was a beautiful illustration of a complicated case of wounds of the liver. The wound in the stomach was repaired and the wound in the liver plugged; a stab above the pubes made and irrigation with closure resorted to, followed by recovery.

A second case illustrated very forcibly a subcutaneous wound of the liver, one upon whom he had recently operated. The patient was admitted to the St. Louis Hospital with a history of having been run over by a wagon, the wagon crossing his body. The patient was in great shock; he was immediately operated upon. Dr. Brown found a bad laceration of the spleen, a large tear in the right lobe of the liver, and a great deal of hemorrhage, the bulk of the hemorrhage coming from the spleen. He did a splenectomy and sutured the wound in the liver.

The diagnosis of subcutaneous injuries to the liver, the result of trauma applied to the abdominal wall, was of exceeding importance. We were prone to attribute shock in these cases to the effects of trauma, and not to hemorrhage.

In the last six months he had had a very interesting series of cases of this character. In two of these there was injury to the bowel, and in two there was injury to the liver. The case he had just reported, in which he resorted to splenectomy, recovered, as did the one of traumatic rupture of the liver. The two bullet cases died, from the fact that they reached the operating table after they had diffuse general peritonitis. In all cases where there was a history of trauma to the abdomen, whether or not there was a contusion or ecchymosis, if there were muscular rigidity and symptoms pointing to intraperitoneal trouble, the sooner the cases were operated upon, the better.

In order to do effective work, it was essential to stop the hemorrhage immediately, and if it was stopped immediately a good proportion of the patients would recover.

His experience with uncomplicated wounds of the liver had been exceedingly satisfactory.

There should be no difficulty in making a diagnosis of a gunshot wound of the liver, as frequently from the location of the bullet one could tell the source of the hemorrhage. In all cases where there was a stab or gunshot wound of the abdomen and the wound penetrated, immediate laparotomy should be done to determine the extent of the injury or injuries.

As to the methods of controlling hemorrhage one colud not lay down any hard and fast rules. He had found that gauze packing subserved the purpose better than any method he knew of. It was invariably his custom to pack these wounds with gauze and to bring the gauze out through a stab wound at the side of the injury.

In wounds of this character and in all wounds of the spleen and of injuries penetrating the peritoneal cavity, he believed the incision should be made in the median line. It was possible to make an accurate diagnosis and to determine the exact nature of the injury by an incision in the median line, and if a splenectomy was necessary one could cut completely across the rectus and do such repair work as was essential. The cases that could be dealt with by suture he had found to be limited to those instances of stab wounds and of lacerations the result of trauma. He had not had absolute satisfaction in trying to sew wounds of this character, the result of gunshot. He had never made any effort to do this, but trusted to controlling hemorrhage by gauze plug.

There was one point in regard to the use of gauze which he emphasized especially, and that was leaving the gauze in for eight or nine days. The danger of cholemia in cases of this kind he had not experienced, and he had had no evil results from effects of this character. Time and again the dressings were soaked with bile, but he had never had any indication of bile infection.

The character of suture that he had found of most value was wide, using a curved round needle with heavy catgut.

As to drainage and irrigation in these cases, if the wound

was limited to the liver and there was no complication, he would irrigate, but not drain. Of course gauze drainage he considered nothing more than a tampon. He would not stop here. If he had, in addition to a wound of the liver, a solution of intestinal continuity, he invariably not only irrigated, but drained through a stab wound made above the pubes and put the patient in the Fowler position. The importance of irrigation was the stimulation that resulted from it. These cases bled profusely and he had found by beginning the saline irrigation immediately the abdomen was opened it was the very best method of stimulation. Hypodermoclysis was begun as soon as the patient was admitted to the hospital.

Another point which he emphasized was to do the surgical work as rapidly as possible.

Dr. Charles L. Bonifield was called to see a patient who had been shot and was in great shock. After opening the abdomen he found the cavity filled with blood and an injury similar to the one described by Dr. Gillette in his case. There was a tear through the lower margin of the liver, the bullet having gone through near the edge. It was a rough, jagged tear instead of a round hole. In this case he was able to control the hemorrhage by two mattress sutures of catgut placed far from the wound.

Dr. Robert T. Morris, of New York, said he was glad to hear the resources for the control of hemorrhage mentioned by Dr. Gillette. On the other hand, he thought we were likely to be inclined to use them too often. This was a point of a good deal of moment. Whenever the parenchyma of almost any organ was injured there was an apparently alarming hemorrhage at the outset. For instance, if one made a small incision in the lung, the hemorrhage would be so free that one might be fearful of not being able to control it; but if one kept right at work and disregarded the hemorrhage, it would cease by the time the surgeon was through with his work. The practical point he desired to make was that if the surgeon stopped to control hemorrhage, he wasted time, the structures were misused, so that the hemorrhage kept up and the original object of the operation was lost. This point obtained in injuries of the parenchyma of the liver, the spleen, the lung, or the brain. Therefore, one should learn to disregard wisely this apparently violent hemorrhage from the parenchyma.

If the suture of Dr. Gillette was strong enough to overcome the mechanical force or the hydrostatic power of the blood current, it would cut out of the parenchyma of the liver so rapidly that it would not be effective, so that we must look for another cause for the assistance given by this suture, and this, he thought, we had in the fact that when surfaces were approximated they tended to adhere by a coagulum which formed within a few minutes. If we approximated the liver margins and held them together for five or ten minutes, it was hard to press them apart with a pair of scissors. The mechanical feature was that the formation of a coagulum in this surface was a helpful facto

in this approximation, which Dr. Gillette obtained with his suture.

With regard to bile in the peritoneal cavity, he had seen free bile in this cavity a number of times when experimenting on dogs and rabbits, and also in patients, and the only effect was to produce a tachycardia, with a normal temperature. If the colon bacillus was found in the peritoneal cavity along with bile we had infective trouble, but when the bile was fairly free from bacteria a large quantity of it could be borne in the peritoneal cavity for some time without giving much concern or cause for alarm. It seemed to him that with the mechanical advantage of Morison's pouch it was a simple matter to take care of the escaping bile.

THE BYRNE OPERATION AND ITS APPLICATION IN THE RADICAL TREATMENT OF CANCER OF THE UTERUS.*

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CANCER of the body of the uterus is in many respects, especially in its clinical course, so different from that of the cervical variety, that it is necessary in the consideration of its treatment to regard them as two separate and distinct forms. Carcinoma of the body, unlike that of the cervix, is of comparatively slow growth, is less likely to extend to the parametria in its earlier stages, and glandular involvement takes place at a late period; hence it is less malignant in its course, in a clinical sense at least, than cancer of the cervix and its operative results probably surpass those obtained for cancer in any other organ in the body. In support of this statement I only need to adduce the statistics of Doederlein who in ten cases surviving operation (Fritsch and Landau in three respectively) had 100 per cent. of cures, all cases having been treated by vaginal hysterectomy. A reasonably early extirpation of the uterus seems to insure a complete cure in the majority of these cases. Whether done per vaginam or by the abdominal route is a matter of secondary consideration, and the procedure depends largely on the technical advantages which the one or the other route presents in a given case.

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While the treatment of cancer of the body of the uterus seems therefore to be definitely settled, such is by no means the case with cervical carcinoma; in fact, the question of what to do with this form of cancer seems to be in a more chaotic condition than ever before. An ordinary simple vaginal hysterectomy is undoubtedly of little benefit excepting possibly in the very earliest forms, rarely seen by the surgeon, because the disease cannot be removed with sufficient thoroughness, especially in the parametria and surrounding vaginal tissues and implantation in the fresh wound surfaces with cancer elements cannot be avoided.

These two reasons account for the recurrences which take place after these operations at or near the vaginal scar in from 75 to 90 per cent. of the cases (Winter, Mangiagalli and others). These unfavorable results induced the writer about eight years ago to adopt a new method by which the uterus as well as a portion of the vagina could be removed in mass, thereby enabling a more thorough extirpation of the parametria and at the same time preventing all danger of implantation. (A New Operation for the Radical Treatment of Cancer of the Uterus Consisting of the Removal of the Uterus and Vagina *en masse* by the Suprapubic Method. American Journal of Obstetrics, New York, March, 1898.)

This operation which is now generally known as the Wertheim operation—the Wertheim operation is nothing more or less than the procedure first performed and described by the writer to which he subsequently added the extirpation of the regional glands according to the method originated by Ries—gave rise to sanguine expectations of better results in the treatment of carcinoma of the cervix and justly so, because the percentage of cures has unquestionably been increased by it, but unfortunately largely at the expense of our operative mortality. The average mortality of this operation in the hands of seventeen well-known operators, according to Gellhorn ("Sacravaginal or Abdominal Operation in Carcinoma of the Uterus," Am. Journal of Obstetrics, July, 1905), is 21.5 per cent. or about four times that of the vaginal hysterectomy. The question under these circumstances naturally arises, is the percentage of permanent cures by means of this new radical operation sufficiently large as compared with those of the older methods to justify its greatly increased risks? While no large statistics are as yet obtainable, it can safely be stated that few will surpass the results reported by Olshausen, of whose 169 cases surviving opera-

tion 38.85 per cent. were free from recurrence after five years; and these cases were operated by vaginal hysterectomy with a mortality of six per cent. ("Zur Statistik und Operation des Uteruskrebses," *Verhandlungen der Deutschen Gesellschaft fur Gynaekologie*, 1901, p. 159). Zwiefel's primary mortality by vaginal hysterectomy is 5. 45 per cent. with 35.6 per cent. of cures after five years. The same considerations induced the writer to abandon the abdominal method originated by him, at least as a routine procedure, over one and a half years ago and when looking round for a good substitute his attention was directed by an article of R. Lomer("Zur Frage der Heilbarkeit des Carcinoms," *Zeitschrift fur Geburtshilft u Gynaekologie Bd. L.*) to the cautery and particularly to the Byrne operation. By his method Byrne operated on 367 cases of cancer of the uterus of which at the end of five years 19 per cent. were still alive, a result sufficiently remarkable when we consider that it was obtained by a simple minor operation without a single death.

The operative technique employed by Byrne is best described by himself. (*Transactions of the American Gynecological Society*, vol. 16, page 172.) "An expanding double tenaculum forceps was passed well up the cervical canal and when opened the uterus was so firmly held that any degree of traction could be steadily maintained. A circular fissure close to the vaginal insertion was next made for the reception of the platinum loop, the cautery knife being directed obliquely upward and inward. The wire being now adjusted and firm traction kept up the loop was contracted at proper intervals (tightening the slack merely) until the part embraced was severed. A sharp curet was next passed within the uterine cavity and the latter was thoroughly scraped out. Sufficient space having thus been made for another electrode, but having a larger cauterizing area, the interior was gone over so as to remove and destroy all softened and diseased tissue with which it might come in contact. The cavity was now sponged out very carefully and a tampon soaked in acetic acid and tannin applied for a few minutes so as to prepare the parts for the next and perhaps most important step of the operation. A dome-shaped cautery instrument brought to a cherry-red heat was applied to the excavation in every part, and when withdrawn the cavity was sponged out, dried and again cauterized until the parts were completely charred and black." He further stated that "I have occasionally modified he proceeding just described by continuing the dissection of

the cervix from the bladder, rectum and lateral connections as in vaginal hysterectomy and completing the amputation with the cautery knife instead of the loop."

Byrne in all his writings on the subject places special emphasis on the importance of thorough and repeated cauterization of the wound surfaces and edges from which cancerous material has been removed, regarding it as the "best safeguard against a recurrence of the disease." He thinks that "there is hardly any doubt that the developmental activity of the cancer cells or germs, in certain stages and under certain conditions, may be arrested or permanently destroyed by a degree of heat much below that which would be detrimental, if not destructive, to normal tissues; he is certain that the thermal agent exerts some modifying influence on pathological processes much beyond and deeper than the surface actually cauterized, hence the importance of repeated applications so that every spot suspected of contamination may be thoroughly charred." (Byrne, *Transactions of American Gynecological Society*, vol. 14, 1889.)

The most remarkable feature of the Byrne operation when compared to all other operations undertaken through the vagina for the cure of cancer of the cervix, and one which seems to justify Byrne's conclusions above cited, is the almost uniform absence of local recurrences. Byrne says (*Transactions of the American Gynecological Society*, 1888, page 188): "I have never known an instance of relapse in which the disease has returned to the part from which it had originally been excised. I have repeatedly observed the reappearance of the disease in the fundus, ovaries or some of the adjacent tissues, but I have never known a single instance in which the disease has reappeared on, or very close to, the cauterized surface from which the cervix had been removed by galvano-cautery." This result certainly seems to demonstrate the fact that the influence of the cautery extends much beyond the surface with which it is in contact, and destroys cancer elements much beyond the actual field of operation, showing a marked superiority to the knife or other cutting instruments. The cause of the absence of local recurrences following the cautery must be attributed not only to the deeper destruction produced, but also to the occlusion and obliteration of all blood and lymph vessels in the field of operation, making absorption and implantation of cancer elements unquestionably a fruitful source of recurrence in the ordinary cutting operations, an impossibility.

It is particularly this feature of the operation, namely entire

absence of local recurrences, that very forcibly impressed the writer, as it seemed to show a way by which the main causes of such frequent local recidives in the vaginal operations for cancer of the cervix might be avoided without resorting to the very dangerous expedients now in vogue. Simple cautery amputations of the cervix, though so successful in Byrne's hands, hardly meets the requirements of modern surgery, which favors complete extirpation of the organ and its appendages, especially as that can be accomplished with but little more risk and should considerably enhance the patient's chances of a permanent cure. Even Byrne himself admits that in many cases he saw the disease return in the fundus uteri and ovaries; had these been removed many more permanent cures might have been effected.

While employing the method described by Byrne in my first cases, I invariably followed it by the ablation of the remaining portion of the uterine body and appendages. Subsequently, however, I simplified the procedure very materially by dispensing with the preliminary amputation of the cervix which is in itself a tedious and time-consuming operation without any signal advantage when the extirpation of the entire organ is intended. The principal features of the Byrne operation, however, have been retained—namely, thorough and repeated cauterization of all wound surfaces and edges. The operation, therefore, differs from the usual vaginal hysterectomy by the use of the cautery knife for detaching the cervix from its vaginal connections, the application of the electrothermic clamps devised by Downes and the final cauterization of the stump with the dome-shaped cautery. An extensive resection of the parametria is, of course, regarded an essential requirement for a successful operation, as recent researches have shown that in fifty per cent. of the cases the parametria are more or less involved even though they present no clinical evidence of extension to these tissues.

The technic employed at the present time is as follows: the cervix is curetted with a heavy, sharp spoon curet until all necrotic tissues are removed and the bleeding surfaces cauterized until all oozing is controlled. The cervix is then firmly held by volsella forceps and an incision is made entirely around the cervix at a considerable distance from the affected area by means of the cautery knife, keeping it at dull heat and never turning on the current until the knife is placed against the tissues to be burned. In this manner no oozing will take place and the parts

will remain perfectly dry. While making traction upon the cervix the dissection is carried up carefully between the bladder and uterus, an assistant with a retractor drawing the bladder well away from the hot knife. With the aid of the index finger the peritoneum is then reached and opened with a blunt scissors. Douglas's pouch is opened posteriorly in the same manner and the lateral vaginal attachments are burned through. The bladder is then widely separated from the uterus and broad ligaments by inserting the index fingers of both hands with the palmer surfaces directed towards both both pelvic walls and making firm lateral traction. The fundus uteri is then seized with volsellum forceps and dragged down into the vaginal outlet, while a broad retractor in the hands of an assistant holds up the bladder against the symphysis pubis and well out of the way during the subsequent steps of the operation. Pads are now introduced into the pelvis to hold back and protect the abdominal contents. Ordinary heavy clamps are then applied to the whole broad ligament, first on one side, two usually being required on either side; the same procedure is then repeated on the other side and the entire uterus and appendages removed.

Thus far the operation differs very little from the old clamp method of vaginal hysterectomy excepting that all incisions have been made with the cautery knife. After packing off the pelvic cavity very carefully with gauze pads, the upper clamp on the infundibulo-pelvic ligament is seized, the ligament put on a stretch and a Downes electrothermic clamp applied externally to it; protected by the shield and additional pads, if necessary, and the tissues included in the forceps are then thoroughly cooked until a good ribbon is obtained. The Downes clamp is then removed, the ribbon cut through near its inner edge, and, if after a few moments no bleeding occurs, dropped. The next clamps are then treated in exactly the same manner until both ligaments and all other uterine attachments have undergone this cooking process.

The large, broad Downes clamps should always be used in this operation, as the smaller forceps is scarcely sufficient protection against bleeding, the narrow ribbon often opening up immediately after the clamp is removed requiring ligation of the bleeding vessels, while the larger broad ribbon rarely gives any trouble. Careful attention should be given to the oiling of the clamp surfaces, as neglect in this matter frequently causes a baking of the boiled tissues to its surfaces, thereby preventing the formation of the desired paper-thin ribbon and resulting in

free hemorrhage. If no bleeding is observed for a period of one minute the stump can be safely dropped and hemostasis is fully as secure as by means of ligatures.

The application of the ordinary clamps and the removal of the uterus first before resorting to Downes's instruments gives the operator this distinct advantage that the field is under better view and control, and by using the clamps on the broad ligaments as handles we can expose a larger portion of the ligaments and get a better bite with the Downes instruments than would be possible if we applied the latter while the uterus is still *in situ*. Particularly is this the case with the base of the ligaments or parametria on the extensive removal of which the successful issue of many cases will depend.

The last step of the operation is another cauterization of the stumps. For this purpose the parametrial pedicles are gently grasped with forceps, and after the surrounding tissues are carefully protected with pads they are completely seared and charred with the dome-cautery. It will be seen that the Byrne principle of thorough and repeated cauterization is carried out literally in this operation, because not a single structure from which extension of the disease might occur escapes repeated exposure to heat sufficiently intense to insure destruction of all cancer elements, not only in the parts directly treated but probably for some distance beyond. We, therefore, not only remove large portions of the parametria, but, we try by repeated cauterization, for which Byrne so insistently pleads as the best safeguard against recurrence, to destroy the cancer elements in at least a part of the tissues remaining.

The final steps of the operation, after thorough cleansing of the pelvic cavity and vagina, are the grasping of the bladder peritoneum anteriorly, and the peritoneum of Douglas's pouch posteriorly, and uniting the two surfaces by a few catgut sutures, thus closing the pelvic cavity but leaving sufficient space on either side along the charred stumps of the parametria to insert an iodoform gauze drain, which is left in place for about four or five days.

The remarkable feature of the convalescence of the patients operated on in the manner described is the entire absence of pain. No other operation is followed by so little discomfort; patients usually make an ideal recovery.

Of the sixteen cases operated on by me only one died, about four weeks after the operation, from uremia, the result of renal disease from which she is supposed to have suffered for

ten years previously; the operation itself may have hastened, but not caused her death.

That the cautery method is a little more liable to be followed by injuries of adjacent organs must be admitted, though with a little more experience they can, no doubt, be reduced to a minimum. In my cases the bladder was injured twice, once with the fingers in separating it from the uterus; the tear was immediately discovered and repaired, but leakage occurred about ten days later. The case was an adenocarcinoma of the cervix rather far advanced which had extended to the bladder wall. In a third case a rectovaginal fistula resulted. No other injuries were encountered.

It may be objected that in abandoning the suprapubic hysterectomy in favor of the vaginal method we are taking a step backward, because we cannot expect to do as radical work per vaginam as through the abdominal route, and above all we must give up all efforts to remove the regional glands. There are no doubt cases which can best be managed from above, but with the aid of Schuchardt's vaginal incision the pelvis can be made so accessible that but few cases cannot be satisfactorily dealt with from the vagina. In regard to the routine removal of the lymphatic glands recent investigations, especially those of Schauta, have demonstrated that the complete extirpation of all glands liable to become involved is a surgical impossibility. If that be the case no good can result from a partial removal, and as this additional step of an already dangerous operation increases the primary mortality quite considerably, the sooner it is abandoned the better for our patients.

Wertheim's experience, whose cases, in which the glands were found diseased, practically all had recurrences, is a fairly convincing proof of Olshausen's statement that when the lymphatic system has become extensively involved a hopeless stage has been reached.

524 Penn Avenue.

DISCUSSION.

Dr. Walter B. Chase, of Brooklyn, N. Y., congratulated the essayist on the position he had taken. The statistics of operative procedures in the radical cure of cancer of the cervix were as unsatisfactory as those of extirpation of the uterus for malignant disease. It was the speaker's fortune to know Dr. Byrne intimately, and to have witnessed his operations repeatedly, and while he remembered the disfavor with which Dr. Byrne's paper was received by the American Gynecological Society, he was confident that he had enunciated principles and

facts which were not only worthy of careful consideration, but of surgical following.

Dr. Byrne was a careful observer. He was a most conscientious man, and the statements made by him regarding what he had done were modest. From the speaker's own experience, he was confident that in the use of thermocautery, galvanic or otherwise, we had a valuable mode of dealing with malignant disease of the cervix. which did not involve danger to the patient.

Dr. Walter J. Corcoran, of Brooklyn, N. Y., was asked to participate in the discussion, as he had been an assistant of Dr. Byrne. He confirmed all that had been said regarding the original Byrne operation. Dr. Byrne operated on every case of cancer of the cervix that came to him, and at least half of the cases included in his statistics were hardly touched by other men, except given curettement and tampons, so that the statistics of Byrne were even better than those presented by him. In cancer of the cervix in the incipient stage he believed it was *the* operation, as it would accomplish anything that could be done by hysterectomy. He believed that the influence of the Byrne operation extended far beyond what the knife touched. There was something in the electric cautery more than we knew or could explain. It accomplished more than the actual burn. The Byrne operation had been condemned on account of the inexperience of those who had used it. The ordinary temptation in using the cautery knife was to press on it the same as upon any other instrument. This was wrong. It should simply be laid against the tissues and allowed to eat its way through.. When this method was fully developed, he thought it would come to be the operation of choice in the class of cases under discussion.

Dr. Joseph Price desired to say that the cautery had been used, and was being used very commonly throughout the country. A number of men felt there was little difference between the thorough use of the cautery and the sharp curette, and that patients lived as long following the use of the curette and cautery as they did after clean extirpations.

Dr. Herman J. Boldt, of New York, by invitation, said that he reserved the cautery operation for those cases where the disease had gone beyond the boundary of the uterus proper, and had invaded the broad ligaments and parametria to such an extent that it was simply a question of recurrence sooner or later.

The patients were made more comfortable by the cautery operation; they lived a comparatively long period of time if the operation was thoroughly done. There was, however, one case in his own experience which he desired to put on record, showing that there was some secondary risk after the ordinary charring of the surface. Two or three years ago he did a very thorough cautery operation, where the scar tissue, rather charred tissue, came away from the patient in the middle of the night, and she bled to death from a spurting branch of the uterine artery, which a physician endeavored to control. He was

called, but the woman was exsanguinated. He did the best he could; he tamponed with perchloride of iron, but in spite of this she bled to death.

The danger to which the essayist had alluded of secondary injury from the cautery was undoubtedly present. The speaker himself, after doing a hysterectomy for carcinoma, complicated by fibroids, subsequently used the cautery on the stumps all around, and although the pelvis was well packed off with gauze, he had a sloughing of the ureter four days after operation. A day or two later this patient was found to have an injury of both ureters, yet at the present time she was living and in good health. Ureteral implantation was made subsequently, and she was cured of the cancer.

Dr. Werder, in closing the discussion, was very glad that there were two gentlemen who could confirm the reports of Dr. Byrne, for the reason that on several occasions gynecologists had expressed some doubt as to the veracity of Dr. Byrne's statements. There evidently had been some misunderstanding in regard to the operation the essayist had described. He had never done the operation in the way Byrne had performed it, or, in other words, he had done the Byrne operation, but he had always removed the uterus at the same time. He had always done the radical operation. He referred to the radical operation by means of the cautery, but did not care whether one used electric or Paquelin cautery. He did not think electricity played any important rôle in the matter. It was the heat or cauterization, whether one used the Paquelin or galvano-cautery, which brought about the result. The reason he used the galvano-cautery was because it was easier to handle than the Paquelin knife, and one could do better work. It was not so cumbersome; one could make the incisions more carefully than he could with the Paquelin. It was merely a means of getting heat. He had very little or no faith in electricity itself.

PAPILLARY CYSTADENOMA OF THE BREAST.*

BY
EDWARD J. ILL, M.D.,
Newark, N. J.

(With four illustrations.)

It is with some hesitation that I offer you this paper. This disease, when I first encountered it, was the cause of much worry and anxiety, as I could neither make a diagnosis nor a prognosis.

*Read at the Eighteenth Annual Meeting of the American Association of Obstetricians and Gynecologists, at New York, September 19-21, 1905.

The literature at my disposal gave me no assistance. My friends knew nothing of the trouble. A most prominent surgeon of New York, now retired, could only advise removal of the mass to find out what it was.

It was not until my fourth case presented itself that I could get the patient's consent to remove the breast, and thus clear up the character of the trouble. During the last year a short remark in one of the text-books was shown me by Dr. J. L. Fewsmith, which

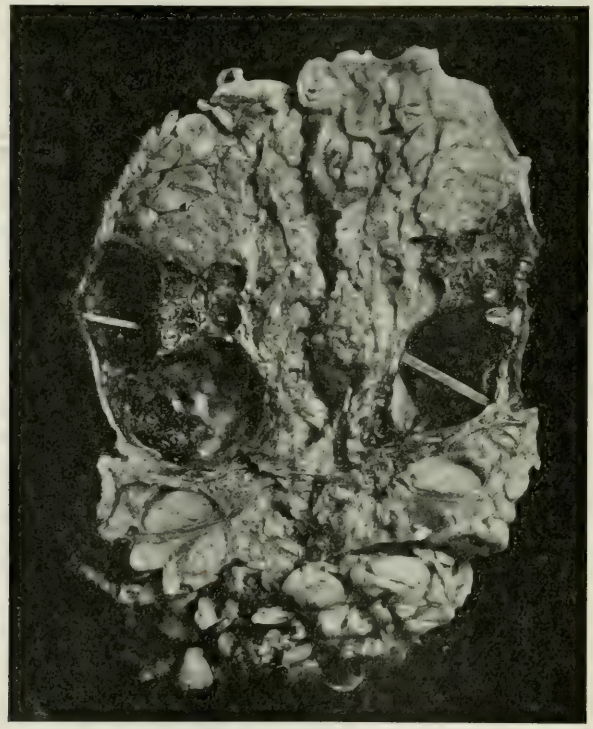


FIG. 1.—Case II. Section Through the Whole Breast.

spoke of a bloody discharge only. I have since found a similar note in a reprint kindly sent to me by Robert Abbé, entitled "Consideration of Mammary Cysts," etc., in which he speaks of a "coffee-like discharge from the nipple" and "a papillary ingrowth."

The life history of these cases, the diagnosis, prognosis and treatment, is what I want to bring to your special attention, and is what I have failed to find described in literature. It appears that all the cases I have seen, except one, were beyond

the middle of life. They came complaining of a more or less copious discharge from the nipple, varying in color from a very light yellowish pink to a dirty brown color. The latter presented itself in one case only. The disease may go on indefinitely, as shown in case No. 2, and thus the greater part of the breast became involved. This case was under observation for twelve years.

The patient herself never notices the tumor in the earlier stages, which an examination, however, shows is always present.

Spontaneous recovery cannot be excluded, as shown by Cases 1 and 2. In Case 3 the discharge continued for five years, and since



FIG. 2.—Case II. Papillomatous Cyst Wall.

six years nothing has been seen of the trouble, except a little scar-like nodule to one side of the nipple.

It seems that no station in life is exempt. I have seen it in the married and the single, the white and the colored, the sterile and the fruitful. The symptom which brings the patient to us is an annoying transparent yellowish pink, or even dark bloody, discharge from the nipple. She is not aware of any tumor. On palpation, however, an elongated mass can be made out running in the radius of the breast and starting a little away from the nipple. It is not sensitive, nor does the patient ever have any pain.

The discharge is often sufficient to soil three or four small handkerchiefs a day.

The pathology of the case is very simple and definite. The discharge is of a serous or bloody character, containing red blood corpuscles, leucocytes and little fatty cell detritus, as shown by numerous small, black spots.

The tumor consists of a papillary adenomatous mass, usually single, but sometimes multinodular, which protrudes into the duct, dilating the duct. By retention of some of the fluid the duct becomes cystic in character. The diagnosis is easily made by the appearance of the fluid and the presence of an elongated mass of

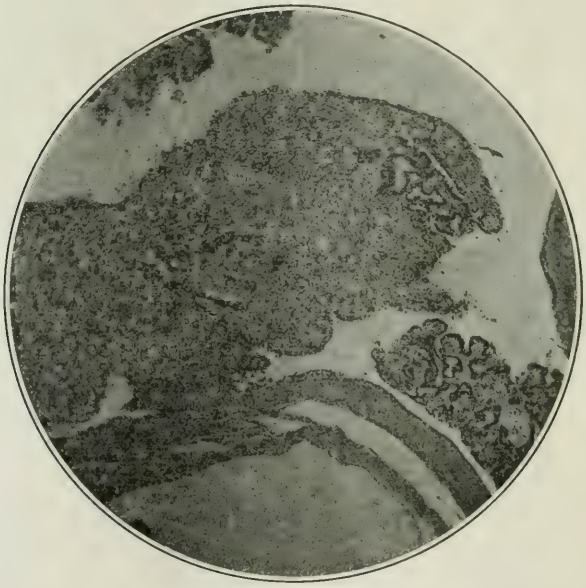


FIG. 3.—Case II. More Advanced Papillomatous Degeneration of Cyst Wall.

greater or lesser size. The prognosis is good, as malignancy can be positively excluded.

As to treatment, I should say that while an operation is not imperative, it is a sure cure. Since two of my cases got well without any treatment, however, one cannot urge any operation. In all cases operated on I have recommended removal of the whole breast, as I did not know the true character of the disease. It will probably remain the best treatment in the woman who is nearing the end of the child-bearing period. A trial to excise the mass would not likely result in much benefit, since it would cut across

so many milk ducts. Deep incision and curettage with drainage might result more favorably.

CASE I.—Mrs. D., aged 47, widow, mother of five children, in robust health, was seen in June, 1880. She had just passed the menopause, when she noticed a serous discharge from the nipple, which was intermittent to such an extent that she took it to be a vicarious menstruation. A very small mass in the left breast, near the nipple, could be made out. In about a year the discharge ceased entirely, and she lived until August, 1901, dying of chronic nephritis.

CASE II.—Mrs. E. G., colored, domestic, married, no children, was sent by her mistress in May, 1893, because of a discharge from the left breast. The woman was nearly forty-three years old, menstruated regularly, and was in good general health. Several years previously removed a large, bleeding fibropolypus from the uterus. There was a discharge from the left breast, copious enough during the day, to produce several spots, as large as a silver dollar, in a handkerchief. Menstruation had no effect on the discharge. The discharge was a yellowish, transparent fluid, which, under the microscope, showed a few red blood corpuscles and leucocytes and some small black granular bodies, probably broken-down cells. An oblong mass about 2 cm. in diameter and 1 cm. wide was discovered running from a little beyond the nipple inwardly. Gentle pressure on this mass showed that the discharge came from that source.

I saw her three or four times during the next two years and then lost sight of her until June, 1900. The mass had grown somewhat larger and the discharge more copious. She occasionally presented herself, and in 1903 it was noticed that the tumor had become multinodular, with a greatly increased quantity of flow from the nipple. These masses had a doughy and slightly fluctuating feeling. On March 13, 1905, the breast was removed.

This specimen shows the condition remarkably well, as do also the microphotograph and schematic drawings kindly made by Dr. Teeter.

The tumor proved to be a papillary cystadenoma of the breast.

CASE III.—Mrs. R., German Jewess, aged 45 years, was first seen in May, 1894. She was of a healthy family, menstruated regularly and painlessly, and was mother of two girls, the youngest sixteen years old. She nursed both girls the usual length of time. Her general health was good and she appeared well nourished. She complained of a discharge from the nipple, which came

on a month ago, and was continuous. It was more copious during the day than at night and while exercising. It left a yellowish brown stain on her clothing. Menstruation had no effect on the discharge. Upon examination, a small, flat mass was felt extending from the nipple outward and upwards for about 2 cm. and was ½ cm. wide. Careful examination showed that the serous discharge came from this small tumor, as gentle pressure on it would cause a drop to ooze from the nipple, while pressure on any other location would not have a similar effect. The discharge was of a



FIG. 4—Case V. C, Cyst Wall. Papilloma Below.

clear, yellowish pink character, and under the microscope showed an occasional red blood corpuscle and still fewer leucocytes, and now and then black, granular bodies, smaller than red-blood corpuscles. This was found in all the specimens examined hereafter.

There was not the slightest pain, nor was there any during the next five years. She was very much averse to the use of the knife, and once consulted a prominent surgeon (now retired) of New York, who gave no opinion, but advised that the tumor be laid open for diagnosis' sake. There was never any operation, how-

ever, and various applications were made, only to keep track of the patient. Once in two or three months she would present herself, always fearing malignancy. The discharge never changed in any particular, though she soon passed through the menopause. In 1898 there was a marked decrease in the discharge, and in another year it ceased entirely. During the last six years she remained well, and all that can be felt is a longish, cordlike mass running in an upward and outward direction. No anatomical diagnosis was ever made, as removal was not permitted.

Case IV.—Mrs. M., 35 years old and married, mother of several children, all of whom were nursed, was seen in October, 1898, because of a discharge from the right breast, which had lasted for several months. She was a healthy woman, menstruated regularly and painlessly. This function had no effect on the discharge from the nipple. The discharge showed the same condition exactly, both macroscopically and microscopically as the foregoing cases.

Pressure upon a small nodule alongside the breast produced the fluid in several drops. I never saw her again, but was told that the breast was removed, and that she remained well. An examination of the specimen was not made.

Case V.—Mrs. B. was sent by Dr. Pierson, of Roselle, N. J., in May, 1902, for a watery yellowish discharge from the nipple of the left breast. She was married, had no children, and was about thirty-eight years old. This discharge, which was of a clear yellowish pink character, had existed for some months and gave her a great deal of annoyance because of the great quantity. There was rather a large mass to the outer side of the nipple, measuring 2 x 3 cm. Pressure on this mass produced the discharge quite copiously, which became quite bloody when the manipulation was increased in force. Menstruation had no effect either on the discharge nor on the mass. The mass appeared semifluctuating and rather doughy in character.

The discharge under the microscope showed many red-blood corpuscles, leucocytes and small black granular matter.

The patient readily consented to have the breast removed, and I was glad to do it, so as to clear up the nature of this difficulty.

The breast was removed, and Dr. F. W. Bailey, of Elizabeth, kindly examined it for me. He reported it to be a papillary cystadenoma developing in one of the milk ducts.

The microphotograph taken by Dr. Teeter shows the microscopic character of the case very well.

Case VI.—Mrs. W. was sent by Dr. J. G. Wilson, of Perth Amboy, in September, 1902, because of a serous watery discharge from the nipple, which had continued for some months, and did not respond to any treatment. She had a tumor alongside the nipple of the left breast as large as a filbert and slightly prominent. Pressure on the tumor produced a large amount of yellowish pink serous fluid, which under the microscope showed blood corpuscles, leucocytes and black granular bodies. The diagnosis of a papillary cystadenoma was made and Dr. Wilson removed the breast, which he kindly sent to me for examination. Dr. F. W. Bailey showed it to be a papillary cystadenoma.

Case VII.—Mrs. S., of Elizabeth, N. J., married, aged 52 years, mother of several children, was sent by Dr. D. L. Wallace, in September, 1902, with a tumor in the breast. Since five months she noticed a small tumor in the left breast, near the nipple, which gave her no discomfort. Since two weeks she had a copious discharge of thin, yellowish water from the nipple, which soiled a piece of gauze as large as the hand.

Physical examination showed a small, elongated tumor about 1½ cm. in length and radiating upward and inward from the nipple. Pressure from without towards the nipple produced several drops of clear serous yellowish liquid. Under the microscope the fluid showed a few leucocytes, red blood corpuscles, and many small, black granular bodies.

Diagnosis: Papillary cystadenoma of the breast.

Operation, October 4, 1902. The whole breast was removed and the microscope proved the diagnosis.

Case VIII.—Sister S. A., single, teacher, 30 years old, presented herself on October 23, 1904, with a copious, clear, yellowish discharge from the left breast which had lasted some months. This was constant and gave her much annoyance. She desired immediate removal of the cause.

The discharge contained a very few blood corpuscles, leucocytes, and some granular matter. After careful examination a tumor as large as a bean was found to the left of the nipple. Pressure from without produced a large drop of clear, thin, yellowish pink watery discharge.

Diagnosis: Papillary cystadenoma, which was proven by the specimen when it was removed on October 28.

1002 Broad Street.

DISCUSSION.

Dr. Miles F. Porter, of Fort Wayne, Indiana, stated that cystadenoma of the ovaries and of other organs was prone

to become malignant, and whether malignant or not, in his judgment, there was no man alive who could tell until he had removed one of them. Some of these cysts were pronounced by microscopists to be non-malignant, yet there was a recurrence after operation; while others were pronounced malignant, and did not recur after operation. Cystadenoma, therefore, he thought, should be treated as a malignant tumor and removed.

Dr. Joseph Price said that tumors of the breast of a suspicious nature were often disastrous unless removed, and there was no class of cases that gave him more comfort than those upon which he had operated early. He recalled one patient now living in whom he made a clean and complete removal of the breasts seventeen years ago. He had no occasion to regret having removed both breasts in this instance.

Dr. Guenther, in closing the discussion for Dr. Ill, said he did not think there should be any question about malignancy, because, in the first place the patient was not aware that she had a tumor. If she had a tumor, as a usual thing, it was a very small one. In the second place, there was absolutely no involvement of the axillary glands. The only symptoms these patients complained of, and for which they sought medical advice, was a discharge from the nipple. This was the history. There was no history of malignant disease of the breast, aside from the fact that the history of some of these cases showed that where they had not been operated on they went on and eventually recovered after a number of years.

REMARKS ON THE INDICATIONS FOR HYSTERECTOMY IN ACUTE PUERPERAL SEPTICEMIA.*

BY

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The question of hysterectomy for acute puerperal septicemia is as yet far from settled and it would be quite illogical to propose this interference in all cases of serious infection. However, the greatest difficulty appears to be to exactly determine at just what time during the progress of the disease the operation should be undertaken. In order to arrive at some conclusion, clinical examination, as well as laboratory methods, must be carefully considered. Although much discord reigns among sur-

*Read at the Eighteenth Annual Meeting of the American Association of Obstetricians and Gynecologists, at New York, September 19-21, 1905.

geons, as becomes evident from the discussions on this topic which have occurred at the American Medical Association in 1895, at the Surgical Society of Paris in 1901, the Obstetrical Society of Paris in the same year, the discussion of the International Congress of Gynecology, held at Rome, in 1902, and the International Medical Congress held at Madrid in 1903, yet it is to be hoped that in the near future the question may be settled, and in this paper I shall merely consider whether or not this operation is indicated in cases of generalized infection.

In order that hysterectomy may become a legitimate operation in acute puerperal septicemia, it is evident that the uterus must be the seat of marked lesions and form a serious danger for the organism. From this point of view, one may divide the pathology of these puerperal lesions into three groups, namely: (1) The uterus alone presents marked lesions, and in these cases hysterectomy would seem to be distinctly indicated. The operation may also be rendered more legitimate by the coexistence of other lesions, such as rupture of the uterus, adherent placenta, which it is impossible to remove, fibromata or carcinoma. (2) Cases where the uterus presents infectious lesions, but where other lesions exist in the various viscera, such as the spleen or lung. Under these circumstances the advisability of the operation is extremely questionable and for many authorities it is absolutely contraindicated. (3) Those cases where the uterus has only served as an entrance to the infection and is free from any lesion. Here it becomes at once evident that hysterectomy would be worthless.

Now, what is the ordinary condition of the uteri found in generalized puerperal septicemia? Tissier, an ardent enemy of this operation in cases of puerperal septicemia, made the remark before the Obstetrical Society of Paris in 1903 that many operators who were not familiar with obstetrics possessed a very inexact idea of the macroscopical lesions found in women dying of puerperal infection, and that they were apparently ignorant of the usual apparent integrity of the uterus. He also stated that those infrequent examples of abscess and gangrene of the uterus were published while the ordinary cases were not mentioned, so that exceptional lesions of the uterus came to be considered as ordinary and were used as a basis for operators too much inclined to interfere. To back up his assertions, he showed five uteri removed at autopsy during the summer of 1902 which were free from any apparent lesion. Without doubt such cases exist, but that they represent the rule

I cannot admit. In point of fact, the question must be considered more closely, and it will be found that two conditions are met with, namely one where the uterus is macroscopically diseased, the second where macroscopically it is free from any lesion. The first group, namely where macroscopical lesions are present, represents the classical enlarged, soft and friable uterus, having, as Hirst has aptly expressed it, the consistency of cheese. These uteri are easily torn, the veins are thrombosed and on section pus makes its escape from a thousand small lymphatic openings. Mouchotte has collected, in his very excellent thesis, numerous anatomical documents relative to uteri removed by hysterectomy and they would seem to prove that, anatomically, at least, the operation was not a useless proceeding. Leopold removed a uterus presenting metrophlebitis; Rossemburg, a uterus containing a placenta which was extremely adherent and infiltrated with pus; Baldy, a large soft uterus riddled with small abscesses; Penrose, a uterus containing abscesses in the posterior aspect of the left cornu with adherent placental tissue and a generalized cellulitis; Beaussenat, a uterus transformed into a purulent sponge; Stinson, a uterus with a tubouterine abscess on the left side; Mackenrodt, a uterus with generalized septic endometritis and an abscess of the anterior lip of the cervix; Prochownick, a uterus containing in its parenchyma numerous small abscesses; Treub, a very friable uterus with an abscess in its wall; Bouilly, a large, soft uterus easily torn, having a grayish bloody look, fearfully fetid and containing very adherent strips of necrobiotic placenta; Jorfida, a uterus presenting cellular infiltration throughout its entire parenchyma; Grandin, a uterus completely lined with greenish false membrane, the veins being extremely large and filled with clots; Faure, a uterus containing a bit of fetid placenta, lodged in the left cornu; Faure and Mouchotte, a uterus containing an abscess the size of a walnut, divided into several compartments, filled with a concrete pus, while on section several small abscesses were found scattered through the parenchyma; Mauclaire, an enormous, soft, uterus, transformed into a true spongy mass filled with pus. I have myself removed two uteri, one, three days after labor, the other on the eleventh day, the walls of which were so extensively infiltrated by pus that the organs were white when removed.

The foregoing cases are, to say the least, extremely suggestive, and show, in the first place, that uterine abscess and purulent infiltration are, in reality, far more frequent than is generally

admitted and than clinical observation would lead one to suppose. They also show that a uterus transformed into a sponge of pus is not, unfortunately, an anatomic entity merely known to the older writers, because modern surgeons and obstetricians still meet with them. What I have said so far has related exclusively to uterine lesions, but I would also point out that very frequently extrauterine lesions also exist, such as pelvic cellulitis, purulent infiltration of the broad ligaments, suppurative salpingitis, pelvic peritonitis, etc., all lesions whose nature alone formally indicates surgical interference. The simple uterine lesions are far more frequent, but there are others which belong to particular clinical types, such as gangrene or abscess of the uterus. In the former the local lesions are absolutely characteristic ,and Beckmann has given an excellent description of the process.

Upon section the mucosa presents two layers, the external being grayish white in color, recalling compact muscular tissue, the internal layer being dark red and in structure very lax and perforated with numerous cavities. These masses are separated from the healthy tissue by a very distinct line of demarcation, yellow in color, while the necrosed part projects above the surrounding tissues. The rete of the mucosa is the seat of purulent endometritis; it appears uneven, yellowish in color, and covered with purulent exudates. The uterine muscle is edematous, soft, and presents all the characteristics of interstitial metritis. The uterine peritoneum is thickened and opaque, while large, dilated vessels are seen lying over the surface of the organ, which may also present membranous exudate. Consequently, in cases of uterine gangrene the lesions in the organ itself are more evident than any others. There may be a gangrenous process limited to a certain part of the uterus, as Maygrier has shown in two very marked cases. Both of the specimens came from women dying from post abortum infection. The first uterus presented a large loss of substance in the fundus, extending almost from one tube to the other; its borders were fringed and irregular, and appeared purulent. The second uterus was quite similar, being also gangrenous at the fundus, where the muscular layer was almost entirely destroyed, the uterine wall being represented by only a thin blackish peritoneum, which was pierced by several little holes, while a large perforation gave communication between the uterine and peritoneal cavities. In both instances the remainder of the organ was perfectly intact. The clinical history of both cases established the fact that the lesions were gangrenous, and not due to perforations arising during the

abortion. Such instances are of the greatest interest from our point of view, because they offer a precise anatomical indication for the performance of hysterectomy.

In considering uterine abscess I do not intend to study purulent infiltration of the organ, but large abscesses isolated one from the other, or even single ones. Such abscesses are found usually near the orifice of the tube, or on the side of the uterus in the neighborhood of the large lymphatic vessels. In size they vary greatly, their walls being formed by the uterine muscle, and the peritoneum covering the abscess is thickened and hyperemic. The lymphatic vessels all around are dilated and filled with pus. The entire uterus is increased in size on account of the hyperemia and edema. From this description it follows that there are undoubted cases of uterine abscess just as there are undoubted cases of uterine gangrene, and they offer a very distinct and anatomic indication for surgical interference.

There are cases where the uterus presents no macroscopical lesion, but where it would be risky to declare the organ healthy unless carefully studied microscopically. It is absolutely necessary to make a bacteriological examination of the uterine parenchyma before making a diagnosis of the existence or absence of local infectious lesions, and when this is done one will often find that uteri which appear perfectly free from any lesion are in reality filled with bacteria quite capable of attacking the entire organism. In point of fact, many authorities have, under these circumstances, found bacteria throughout the entire thickness of the uterine parenchyma, and Prochownick removed a uterus which was absolutely infiltrated with colonies of streptococcus. In another case this same authority obtained numerous cocci in the liquid gathered by squeezing the uterine muscle. Jorfida found cocci and staphylococci throughout the entire muscle, as well as in the lymph spaces, while Grandin examined a uterus whose parenchyma was riddled with numerous colonies, the streptococcus predominating. Mouchotte has examined numerous uteri removed at autopsy from women dying from puerperal infection. His first case presented a uterus perfectly healthy in appearance, but throughout its entire thickness, as well as in the lymphatics, and especially the veins, the streptococcus and bacillus perfringens were found. The second case showed a uterus whose veins and entire parenchyma were literally packed with the bacillus perfringens, and the same organism was found in all the cellular interstices, in which it had even developed gas bubbles. In the third case the uterus contained in its entire

thickness short chains which in all probability were streptococci. In the fourth case the uterus looked absolutely normal, and its cavity was empty and smooth. Section showed the presence of cocci in a pure state and in great numbers. In the fifth case the uterus was absolutely empty, but section showed a few cocci and bacilli staining by Gram's method, in the parenchyma. All these specimens were obtained postmortem by hysterectomy performed from one to two hours after death, and for this reason it cannot be said that he was dealing with postmortem microbic invasion.

I can bring forward still more positive facts which are above criticism, namely, two uteri coming from women in whom hysterectomy was done for puerperal infection, and which were examined by Jeannin immediately after removal. In the first case there was postpartum infection with generalized septicemia; total abdominal hysterectomy was done on the thirteenth day by Bazy, and the patient died on the forty-fourth day. The uterus was large, but firm, and appeared absolutely healthy. Bits of uterine tissue were immediately removed, both from the midst of the parenchyma and under the peritoneum, and placed in broth in the incubator. At the end of twelve hours the tubes had given growth to numerous chains of streptococcus pyogenes. In the second case there was intrauterine fetal putrefaction with physometra and serious puerperal infection. Supravaginal hysterectomy on the sixth day; patient recovered. The uterus was enlarged and soft, but appeared normal. The endometrium was perfectly smooth, and immediately after removal of the organ blood was taken from the uterine muscle and under the peritoneum. Examined on a cover slip this blood revealed a very rich microbic flora, similar to that which was found in the amniotic fluid of the patient. Cultures developed active colonies of bacillus perfringens and streptococcus. Jeannin points out that what was most striking in this case was the extreme abundance of the bacteria and the rapidity of their penetration to the peritoneum.

From what has been said, we may reasonably conclude that during puerperal septicemia the uterus is frequently the seat of very important and frequently extensive lesions. The most characteristic points of these lesions are: purulent infiltration, small and multiple, or isolated and large abscesses, patches of necrobiosis or gangrene more or less generalized. When a uterus is healthy in appearance it may still be an absolute microbic sponge; not only streptococci, but also the principal aërobic and

anaërobic pathogenic organisms, may occupy the entire parenchyma. From the anatomical standpoint the removal of such an organ can hardly be considered as an illogical surgical procedure.

It must be admitted from the start that the study of the clinical signs furnished in these cases has little weight as far as the indication for removal of the uterus is concerned, especially when each symptom is taken separately. This has been made particularly evident by the discussions which have taken place before the representative societies mentioned at the beginning of this paper. Subinvolution is an ordinary condition found in puerperal infection, and merely indicates that the uterine cavity is not empty, and another condition accompanying this is an abnormal and persistent patency of the cervix. The temperature chart certainly offers many indications as far as the intensity of the infection is concerned, but it is also quite certain that this alone is far from being sufficient to indicate whether or not hysterectomy should be undertaken. Every surgeon has seen numerous instances where the temperature has been 40° C., or higher, and, nevertheless, the patients have recovered. Then, again there are numerous instances where death results even when the temperature has not gone above 38° C. These cases appear to be due to hepatic infection with the colon bacillus. The condition of the pulse also indicates the serious condition of the patient, especially when the rate is far higher than the temperature curve would require; and when the two curves diverge, the temperature becoming lower and the pulse higher, the prognosis is exceedingly bad, and this sign may be one of the most important.

The general condition of the patient is also of great importance, but it may also lead one into error. I would, however, insist upon two particular forms of infection, especially so because it is in these cases that hysterectomy has been particularly advocated. I refer to gangrene of the uterus and abscess of the walls of the organ. The diagnosis of uterine gangrene is of the highest importance, because this type of infection is one of the least discussed as far as the indications for hysterectomy are concerned. Beckmann, in 1900, was able to collect 40 cases of dissecting metritis. In these, labor had usually been long, and in more than 50 per cent. of the cases all kinds of surgical interference had been resorted to. Many of the patients gave evident signs of some other general infection, such as tuberculosis, or syphilis, which rendered them constitutionally less resistant. The temperature rises three or four days after delivery, varying between 38° and 40° C., and is of

a slightly remittent type. The pulse rate increases and is always far out of proportion to the temperature curve. From the commencement the general condition is alarming. There are chills and headache. Involution is delayed, and during the first days the fundus uteri is even higher in the abdomen than immediately after labor, while the cervix is very high up in the vagina.

These symptoms are characteristic, and may be explained by the local edema resulting from disturbances in the circulation. The lochia rapidly becomes fetid and is brownish black in color, spotting the linen with a stain having a dark center and light-colored borders, a sign, by the way, which I have invariably found indicated a septic process. The quantity is large, and increases each day, while the odor is particularly offensive, recalling that of pulmonary gangrene. The discharge reaches its greatest amount at about the third week, and if one presses on the abdomen a flood of purulent liquid may be expressed from the genitalia, occasionally accompanied by fetid gas. The lochia brings down bits of uterine mucosa, which, when they are present, settle the diagnosis.

These strips vary extremely in size and shape; in some instances they form a perfect mould of the uterine cavity; in thickness they vary from 2 to 5 centimeters. Their external aspect is yellow, often covered with exudate or false membranes studded with brown spots. The internal aspect is dark brown, or even black. The elimination of the membrane brings about a fall in the temperature, but when it goes up afterward this is due to the fact that more mucosa is to be eliminated. From the fifth to the seventh day one may also detect a swelling of the uterine walls, which have become soft and relaxed and project into the uterine cavity. This condition is readily discovered by intrauterine examination, which can be easily accomplished on account of the soft, gaping cervix. Edema of the perineum and posterior portions of the labia, due to thrombosis of the pelvic veins, is not always present. This clinical picture is quite characteristic, and the great majority of writers consider that it is a formal indication for hysterectomy. However, the prognosis is far from having the gravity that one might suppose, and Beckmann's statistics show only 11 deaths out of 40 cases, making the mortality 27.5 per cent. Although one might hesitate to undertake hysterectomy as long as uterine gangrene undergoes its evolution without complications, it is evident that as soon as any symptoms of uterine perforation arise, the surgeon is obliged to act.

Uterine abscess is rare and in 1901 von Franqué gave an

excellent description and collected 15 cases. The abscess is the result of a lymphangitic metritis. It is preceded by fever indicating puerperal infection, and sometimes the temperature will fall after the initial rise, until the appearance of the abscess, which manifests its presence by a severe chill and a new rise in temperature. When once the abscess has formed the temperature curve becomes irregular and the same may be said of the pulse. Chills recur and severe abdominal pains are complained of, accompanied with rectal and vesical tenesmus. The uterus is large and tender, while the lochia is fetid. A more or less circumscribed tumefaction, which is apt to be diagnosticated as a lesion of the adnexa, may occasionally be made out on one of the sides of the uterus. Picqué observed a case in which there was an isolated abscess situated in the right side of the uterus and communicating with the cavity of the cervix by quite a large opening, and he points out as a differential diagnostic sign the very marked gaping of the cervix. In another case, Budin was able to make a diagnosis by an intrauterine digital examination, which allowed him to recognize an abscess situated in the right wall of the organ. We have here constantly a clinical modality of puerperal infection which may be diagnosticated in some cases, and when this has been done radical interference is immediately indicated, because if not remedied at once the prognosis is extremely bad, von Franqué having estimated the mortality at 75 per cent. This is due to rupture of the abscess into the peritoneum and consequently hysterectomy appears to be the only rational proceeding. The same may be said in cases of multiple abscesses.

We now come to the question of the propriety of hysterectomy in cases of infection supposed to be due to a single pyogenic organism. It is quite natural to consider the question of hysterectomy upon the ground of the nature of the infection and in order to discover the organism giving rise to the process the best and simplest procedure is to study the contents of the uterus. This has been the subject of much research. We will suppose that the examination of a given case has revealed the fact that a single microorganism is the cause, and the question at once arises in what cases should surgical interference be adopted? Reynier admits three bacteriological varieties of puerperal septicemia, namely, *saprophytic* infection, in which case the uterus ordinarily contains bits of placenta, so that curettage and intrauterine irrigations give excellent results;

gonococcic infection, in which case curettage is contraindicated, the best treatment being frequently repeated intrauterine irrigations: *streptococcic* infection, which represents the great puerperal septicemia, the one which has always been feared. In the serious forms of this process Reynier doubts whether hysterectomy will have any great influence over the infection, and he comes to the conclusión that it is better to abstain from all radical interference, no matter what may be the type of microorganism giving rise to it.

Personally, I believe that the bacteriological examination to ascertain the nature of the pyogenic organism giving rise to the septicemia is hardly of any value clinically, because it necessitates the inoculation of animals and the growing of cultures in order to determine the exact nature of the microbe, and this always requires a delay of at least twenty-four to forty-eight hours, or even more, which may be the means of losing valuable time. In reality I believe that the problem is far more complex, because in most cases the infection is due to more than one type of organism, the larger number being the result of polymicrobic infection. This is a conclusion which is absolutely verified by all modern researches. Du Bouchet found this condition four times out of five, Hallé four times out of four, Brindeau and Mace two times out of three, Jeannin seventeen out of eighteen and Mouchotte fourteen out of sixteen. Thus we find out of 46 cases examined by the above-mentioned authorities there was a polymicrobic infection in 41. On the other hand, it does not appear that the gravity of each infection results from the particular combination of organisms present. Mouchotte collected various cases of post abortum infection with the following results: out of 100 cases of post abortum infection microbic symbiosis was present 94 times, and out of the cases where this symbiosis existed the prognosis was good in more than two-thirds. In other words, out of 100 cases the patients recovered in 78, death occurring in 22. From this it readily becomes evident that the prognosis of puerperal septicemia cannot be made merely by the presence of such or such an intrauterine organism, nor by the presence of a microbic symbiosis. Bacteriological examination furnishes no indication for hysterectomy.

In other than those cases where a rupture or perforation of the uterus exists, there can never be a question of performing hysterectomy at once in a case of puerperal septicemia. One should always resort to the well-known minor methods. It is

only after all these measures have failed that the question of removing the uterus will arise. If, after careful intrauterine treatment the infection continues its evolution, it at once becomes evident that the treatment has been insufficient. Time, however, presses, and one cannot wait several days in order to ascertain what is going to happen, because it will then be too late to attain any result from a radical operation. It is necessary to decide quickly within the next two days, and this is of very great clinical difficulty. At any rate one may be quite right in delaying radical operation and continuing intrauterine operations if, after the first curettage, there is an improvement in the general condition, a disappearance of the fetidity of the lochia, uterine regression and closure of the cervix. The temperature curve and pulse should be attentively watched throughout, and in those cases where the fall is permanent after curettement, it is evident that this operation has been sufficient. There then are those cases in which the chart shows an elevation of the temperature after operation, under which circumstances one of two conditions will be observed. The first is where there is a progressive decrease, in other words, lysis, and here there is every reason to hope that it will not rise again. Should it do so, it is symptomatic of some metastatic complication. In the second case the temperature continues to rise, and, although this may be only temporary, some doubt should be allowed as to the efficacy of the curettage. It is in just these cases that the question of the advisability of hysterectomy may be entertained. It is in these uncertain cases that a blood count is of extreme importance, because when curettage is sufficient the polynuclear leucocytosis diminishes and the eosinophiles appear. When this operation is insufficient the polynuclear leucocytosis persists and eosinophilia is absent, as has been clinically demonstrated by Mouchotte.

The presence of some microorganism in the blood has been considered by some as an indication or a contraindication to hysterectomy, and in the first place it is necessay to determine the prognostic value of this bacteriemia. Petruschky was one of the first to consider this question, and his researches, undertaken in 1894, showed that the presence of the streptococcus in the blood did not necessarily entail a bad prognosis any more than the absence of microorganisms indicated a favorable prognosis. Out of fourteen cases which he examined, organisms were found nine times, once the staphylococcus and eight times the streptococcus. Among the latter three patients died, and among those

who recovered the organism revealed an extreme virulence. In the five cases where the result was negative there was one case of generalized streptococcic infection proven by autopsy. In 1899, Prochownick solved the question in a very simple way, namely, that all women in whom there was a positive result died, and in all those in whom it was negative recovery resulted, no matter how serious were the symptoms. These conclusions, which are in direct opposition to those arrived at by Petruschky, have since been found erroneous. Klein confirmed the conclusions of the former authority, while Queirel has reported two cases of women who recovered in spite of the presence of streptococci in the blood. Bluysen has published two cases in which blood examination showed the presence of streptococci in a pure state, and both patients recovered after curettage, and Carton and Mouchotte have recorded two instances where blood examination was negative and still both patients died from an anaërobic infection.

Lemierre (Thesis, Paris, 1904), has gone into the study very carefully. He examined the blood of fifteen patients afflicted with puerperal septicemia of varying degrees of severity and presenting different clinical pictures. Of these fifteen cases ten recovered and five died. Out of the ten favorable cases the streptococcus was found twice in the blood, and in the fatal cases the cultures were positive in three. This authority arrives at the conclusion that it is difficult to formulate any absolute prognosis from the findings of a blood examination in puerperal septicemia, and that the facts observed allow one to say only that streptococcemia is very frequent, almost always present in fatal cases; it may exist, although far less infrequently, in cases having a favorable outcome, and particularly in those which appear serious.

The very varying results obtained by investigators are due to numerous causes, in the first place to the fact that bacteria remain with difficulty in the blood, because, as is well known, living blood is a very poor culture medium, both on account of the oxygen it contains and the millions of phagocytes that travel through it. In the same patient blood taken after an interval of two hours may give very different results, being positive at one time and negative at another. Still more, in order that this examination shall have any value whatsoever a particular technique must be followed out. The greater number of investigators have merely contented themselves with inoculating blood obtained by pricking the finger, and have thus exposed themselves to a double chance for mistake. Living bacilli may be

present on the integument of the patient, and the absence of a positive result may prove only that the quantity of blood taken was insufficient. Lemierre points out the necessity of removing quite a large quantity of blood, namely, from five to twenty cubic centimeters. The technique that he employed appears to me the best. The blood is removed by a syringe having a capacity of ten cubic centimeters and possessed of a steel needle whose capacity is from four to five cubic centimeters. After careful cutaneous disinfection, the needle is inserted into one of the veins of the elbow, which is rendered prominent by a ligature applied on the arm. By this means from ten to twenty cubic centimeters of blood can be taken, and inoculated in flasks containing 500 cubic centimeters of peptonized broth for each five cubic centimeters of blood. The flasks are examined once in twenty-four hours.

Prochownick thought that, if there was a streptococcic focus in the uterus throwing a large number of bacteria into the blood at each chill, one should resort to a radical interference if the blood examination was positive. He, however, has not been copied by other authorities, because the larger number have considered the presence of this organism in the blood as an absolute contraindication. In point of fact it is difficult to conceive how surgery can help a woman whose organism is thoroughly invaded by infectious bacteria, and at the International Congress, held at Rome, in 1902, all the reporters refused to admit the indication given by Prochownick, while at the Congress at Madrid, Pinard also declared that at the present time bacteriology is powerless to furnish an indication for hysterectomy in acute puerperal septicemia. With that view I am in thorough accord.

From the standpoint of the hematological formula puerperal septicemia may be divided into three groups, namely, the mild, medium and severe. The first is characterized by an increase in the number of red cells, a hyperleucocytosis oscillating around 18,000, but which may reach 28,000, the latter figure being only temporary, a polynuclear leucocytosis hardly exceeding 85 per cent., a decrease in the number of eosinophiles to about 1 per cent. In the medium types, hematology will show a hyperleucocytosis varying between 20,000 and 30,000, a polynuclear leucocytosis reaching or going beyond 90 per cent., the disappearance of the eosinophiles for several days and a greater abundance of the basophile elements. In the serious forms a very temporary increase in red cells takes place, and then these undergo a rapid and progressive diminution; there is a marked

hyperleucocytosis, remaining above 25,000; the polynuclear leucocytosis is permanent and progressive, reaching from 90 to 95 per cent., with permanent disappearance of the eosinophiles and absence of basophile elements, plasma-cells and mast-cells. Among these serious types one should also include primary superacute septicemia, characterized by an absence of leucocytosis or even leucopenia, as is met with in all cases of infection with very rapid progress. Convalescence may be predicted when the leucocytosis and polynuclear leucocytosis decrease, with an increase in the number of red cells and mononuclear leucocytosis, with appearance of the eosinophile and basophile elements.

It is a difficult matter in the present state of our knowledge to come to any absolute decision, but it is very certain that blood examination is very serviceable to surgery in general. We may, however, formulate the following conclusions: (1) hysterectomy is contraindicated in two different conditions, namely, when one finds a hematological formula characterized by the absence of leucocytosis and by leucopenia, because in this case the organism has been so completely infected that any operation would only result disastrously. (2) When blood examination shows a moderate polynuclear leucocytosis varying from 85 to 90 per cent., with a slight leucocytosis, or one rapidly decreasing after having been momentarily high and with the presence of eosinophiles, it means that the prognosis is good and that intrauterine intervention will be sufficient to bring about the cure. Hysterectomy may possibly be indicated in two conditions: namely, when the infection is serious from the start and made evident by a very high leucocytosis, a polynuclear leucocytosis remaining at about 70 per cent., and complete and persistent absence of eosinophile and basophile elements; secondly, when the ordinary minor surgical procedures do not result in decrease in the leucocytosis and polynuclear leucocytosis. I would also point out that a lowering of the leucocytosis can be regarded as favorable only when the eosinophiles reappear in the blood. One should also recall that any visceral complication, such as metastatic abscess, phlebitis, etc., will give rise to a very rapid and marked increase in the leucocytosis.

From what has been said it would seem reasonable to conclude that there are certain cases of puerperal septicemia which might be saved by removal of the uterus, but, up to the present, there are no absolute clinical signs which will allow one to proceed with certainty. Taking all the symptoms carefully into consideration and combining this with a careful intrauterine examina-

tion may lead to an indication for surgical interference after all other therapeutic procedures have failed. Acute septicemia, on account of its rapid evolution, can never be benefited by hysterectomy, but, on the other hand, in cases of secondary septicemia with a slow evolution hysterectomy is indicated. No useful indications can be drawn from a bacteriological examination of the lochia or blood, but, on the other hand, a cytologic examination of the blood furnishes excellent prognostic indications of the infection under consideration.

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DISCUSSION

Dr. Miles F. Porter said we should have a clear conception of the premises before we begin a discussion of this subject. What was meant by puerperal septicemia. Did we mean a bacteriemia. It would be as radical to talk about hysterectomy in typhoid fever as to talk about it in the treatment of a general infection. Until we could infallibly distinguish general from local cases, the question would have to remain unsettled. If there be clearly a local infection that could be removed by operation, operation was demanded. On the other hand, unless this be quite clear to the individual who had the case in charge, operation ought not to be undertaken.

As to the diagnostic point brought out by the essayist, with reference to the staining of the napkins by the discharge being significant of a pathological condition of the uterus, he was inclined, when he first heard of it, to think that there was nothing in it, but since he had talked to Dr. Cumston about it he was inclined to think that was not so.

Dr. Joseph H. Branham, of Baltimore, Md., thought the question hung upon the point as to whether hysterectomy was a procedure that was most likely to save a patient's life in a case of severe infection of the uterus. Of course, at times hysterectomy might give rise to a certain amount of discussion, and he supposed we meant by septicemia in this connection some local infection in which the infective process had extended so that the products of bacteria, and also in many cases the bacteria themselves, were disseminated through the circulation, and at any rate in which the bacterial infection was invading the living tissues of the organ. This was associated nearly always with a good many other symptoms, and even with other conditions, which would not be included under this head.

The speaker had operated on many cases of puerperal septicemia or puerperal infection, in which there was invasion of the uterine tissue as well as local gangrene. Cases were cited in point.

He was called to the country in a hurry to see a case of puerperal infection, and when he arrived at the house he found the woman in such a condition that almost any surgeon present

would have declined to operate. She had a very high pulse rate, with high temperature, but the latter was not as high as it had been. The pulse rate varied from 140 to 150, and the patient was very nearly dead. On examination he found a large, flabby uterus, with a purulent discharge coming from the cervix and with the pelvis boggy. The patient was evidently going to die in a short time if something were not done, so having his instruments with him, the physician who called him in consultation hurriedly gave a small amount of anesthesia to quiet the woman. In examining the uterus he found that the placental site was not only thoroughly infiltrated, but gangrenous. The pelvis was boggy and contained pus. In this case he thoroughly cleaned out the uterus and in so doing had to hurry on account of the patient's condition. He scraped away the gangrenous material as thoroughly as possible, flushed the uterine cavity out thoroughly, and after cleaning and sponging the parts with an antiseptic he introduced a good-sized, carefully arranged wick drain of iodoform gauze, and opened up Douglas' cul-de-sac. He found two large pus tubes, and had no difficulty in mapping them out. This infestion had spread rapidly by way of the tubes; there were large abscesses as well as ovarian abscesses, at least one on the left side, which extended into the pelvis and contained considerable pus. All this was removed and then the tubes, with the finger carefully guided, were opened and four abscesses drained, followed by packing. The patient recovered rapidly.

He operated some time ago on a patient, and drained, in which there was no distinct abscess, but a lot of thickened semiserous purulent material in the cul-de-sac of Douglas, but in which the infection had invaded the uterus. The uterus was cleaned out thoroughly and the patient recovered.

If one could tell which patients upon whom to do a hysterectomy, he might give them the best chance for recovery, but he thought that in nine times out of ten thorough cleaning of the uterus and drainage through Douglas' cul-de-sac would enable patients to recover. In nearly all such instances one would find drainage indicated, and if there was no pus present there would be a thickened serous fluid which contained infective material, and which would help to kill the patient.

Dr. Samuel W. Bandler confined his remarks to the microscopical examination of three uteri that had been removed, one by himself and two by other surgeons for septic infection; all of the patients died. In two of the three cases nothing was shown to the eye, but the microscope showed myriads of small miliary abscesses or necrobiotic spots. In addition to that, in two of the cases an examination of the outermost part of the broad ligament attached to the uterus showed infective thrombi. These infective thrombi might prevent the presence of bacteria in the blood, yet two or three days after the operation was done these bacteria might invade the blood and kill the patient by a genuine septicemia. If it was possible by bimanual or any other examination to arrive at a conclusion as

to what was present, one could then decide which cases should be operated on and which should not be..

Dr. J. Henry Carstens, of Detroit, Michigan, was opposed to operating on the class of cases under discussion. To remove the uteri of these women simply because a few of them were going to die, and unsex them, was unwise, and for this reason he would oppose the operation. He held this opinion many years ago, and saw no reason now to change it. In the form of infection under discussion, by the time one saw the patient there might be secondary deposits in the liver or other organ of the body, and the removal of the uterus would not do a particle of good, as there were other foci of infection which were already beginning to develop. If one could get the patient early, he might once in a while be justified in operating, but he would discourage operations in these cases, even by experts, because every tyro he thought would advocate it and remove uteri, thus hastening the deaths of patients. Some of these women would recover without operation who, with an operation, would be sure to die. He would discourage the operation except in rare cases. If there was simply an abscess of the uterus, it was a different proposition altogether. To increase the power of resistance of the patient was the best thing to do under the circumstances.

Dr. A. Ernest Gallant, of New York City, by invitation, said that if one recalled the cases of puerperal septicemia that died, it would be remembered that they seldom died before the thirtieth day. In other words, there was a prolonged sepsis which gave one plenty of time to make up his mind that he was dealing with a condition that was not temporary. There were infections of the uterus which would respond quickly to local treatment, and those who advocated curettage and packing knew very well that such uteri responded almost at once, in that the temperature would go down and the patients would get well, but of the other varieties of infection he did not care what bacteria there might be, where there was a spongy uterus, if the patient was allowed to go on for three or four or six weeks with this condition the chances were that she would die. Would the surgeon allow such a condition to go on in any other part of the body? Those cases that ran on to the fourth or fifth week were going to die, and it was a question if they would not die after the second week without operation. If we had one of those prolonged cases with the uterus remaining soft and boggy, the temperature going up and down say 102° to-day and 101° to 103° or 104° to-morrow, the only chance, he thought, for such a patient was to remove her uterus. If there were other foci of infection, they would usually take care of themselves, if the original focus of infection was removed. Of the last two cases he observed, one died on the thirty-third day and the other the forty-fourth day.

Dr. J. Henry Carstens said that when these patients had puerperal septicemia and it continued for thirty-three or forty-four days they did not die. Occasionally, a patient would die,

but ordinarily when these patients lived for twenty-one days they recovered. Of three patients who had septicemia, each one was sick for ten weeks, and each one recovered, yet not one of them had a hysterectomy.

Dr. Cumston, in closing the discussion, said the point he wanted to make in his paper was that at the present time there were no signs, clinical or otherwise, which would furnish rational indications for this operation. It would seem, all things considered, that at the present time cases of puerperal septicemia, where no evident localized lesion in the uterus could be detected by a carefully conducted intrauterine examination, should be all treated by conservative methods.

ABDOMINAL HYSTERECTOMY FOR MULTIPLE FIBROIDS COMPLICATED BY PREGNANCY.*

BY
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(With one illustration.)

Fibroid tumors of the uterus are quite common and now frequently removed without much danger. I will not discuss the great necessity of removing them; of removing them promptly, or watching for general developments. That is out of the province of this paper. I simply want to report a case where I thought it was necessary to remove the growth promptly, on account of the suffering and great distress. The history of the case is as follows:

Mrs. F. B., aged 42; menstruation had appeared at twelve years of age, normal, but with some pain and rather scant when young. Later in life the dysmenorrhea ceased and the flow was rather profuse. Occasionally she had slight leucorrhea. She had always been well, no history of injury or of any abdominal inflammation; in fact, she was never sick, but the last four or five years has had some slight dyspepsia, though a fair appetite. She was inclined to constipation and occasionally took a cathartic. Her father is living at 84, her mother died at 73 of some tumors, did not know where located or what kind. She was married seven years ago and never pregnant. Four years ago she noticed a swelling in her abdomen on the left side in the region of the ovary. This was hard and somewhat movable. She paid no attention to it and it gradually increased in size, extending to the right. The growth did not trouble her and as she was in good

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health, she did nothing and consulted no physician about it. Menstruation was regular, but rather profuse until May 4. In June she had slight show and in July she had a more or less slight show for the whole month. Her abdomen now increased very rapidly in size, and she decided to consult a physician. He recognized the growth and urged an operation on account of the rapid increase in size, and brought her to Harper Hospital, where I



examined her and found a large hard tumor filling the pelvis up to the umbilicus. One large growth seemed to be on the left side, another in the cul-de-sac, and small ones could be detected in the lower abdomen. The cervix was shoved forward and high up, and so soft and patulous that I was quite sure she was pregnant. On examining the breasts I found the characteristic enlargement and decided she was pregnant.

It being impossible to deliver her if she went to full term, I

urged a prompt operation and prepared her for the same. August 15, 1905, I operated with the usual technic. There were only slight adhesions and the growth could be lifted out of the adbomen and the supravaginal operation quickly performed. A careful covering of the stump with peritoneum was made and the abdominal incision closed in layers with dry sterilized catgut. The whole operation took only 18 minutes. She was given two pints of saline by rectum, as I usually do in all abdominal sections. She made an uninterrupted recovery, returning home the 18th day.

Examining the growth after the operation, it seemed like any other case of multiple fibroids. Opening the uterus we found a fetus of three months with membranes intact, a photograph of which I here present.

These cases are not very uncommon, still they are sufficiently rare to warrant us in reporting them. If we study their history a few points will strike us. In nearly all instances the woman was sterile, a growth develops, and after some years she becomes pregnant, which naturally makes one suspect that there was some abnormal condition of the uterus, perhaps, some malposition which prevented impregnation, but as the result of the growth, the womb was pulled up or pushed over, in one direction or another in such a way that the ova could pass into the uterus and pregnancy occur. This seems to me the correct explanation of the occurrence of pregnancy in sterile women, after the development of fibroid tumors.

In reference to general rules for this class of cases, I can simply reiterate what I have said on previous occasions: That while no definite rule can be laid down to govern all cases, yet in general:

1. Cases of fibroids complicated by pregnancy can be left alone if they are subperitoneal and located at the upper half of the uterus.

2. Fibroids located in the lower half of the uterus or in the broad ligament should be operated upon.

3. Fibroids adherent or complicated with other pelvic diseases should be removed by enucleation, or in some cases an abdominal hysterectomy should be performed.

620 Woodward Avenue.

DISCUSSION.

Dr. Joseph H. Branham said that cases of uterine myomata were always of special interest. He recalled a patient, the wife of a rather prominent physician, who had a child nearly twelve years ago and had been sterile since that time. She had had two children during her early married life. She was

brought to him about four years ago by her husband, and on examination he found a single large myoma on the anterior part of the fundus uteri. He advised the husband that while he did not consider it absolutely necessary to operate at once, still he thought that if the growth increased in size his wife should be operated upon. The operation was not done, but nearly a year afterwards she again presented herself, with a history of being irregular in her menstruation, and the tumor was growing more rapidly. On examination he was able to detect a tumor of considerable size, which was located in the anterior and upper part of the uterus. The uterus itself with the fundus was turned downward and the cervix upward and forward, where it could be reached with great difficulty; it was large, soft, swollen, the tumor being complicated by pregnancy. It was imperative at the time that an operation should be done at once. The uterus was removed. The operation was uneventful, except that the bladder was opened, but this opening was closed without any trouble.

He had done a number of these operations and this was the only accident he had ever had. He thought he had avoided the bladder in this case, but it was pulled on to such an extent that he made a nick in it before he noticed it.

Dr. Frank D. Thompson, of Fort Worth, Texas, reported a case upon which he operated in 1904, in which there was a large single fibroid in the lower portion of the uterus. The patient was thirty-two years of age, had been married twelve years, but had never borne any children. She was four and one-half months pregnant. The fetus was in the upper portion of the uterus, the large portion being filled with a fibroid as large as a fetal head at full term. Under the circumstances, he thought the only way to save her life was to remove the uterus, and this was done while she was in good condition, with very little loss of blood and without any accident or complications. She made a very prompt recovery.

Dr. Louis Frank, of Louisville, Kentucky, said the treatment of fibroid tumors of the uterus as a complication of pregnancy was a most interesting subject and one which deserved possibly a little more discussion than the members seemed inclined to give it. He had had a little experience with these cases, seeing them at times during the course of pregnancy from the first month up to and even after delivery, and had had to deal with some of the complications that arose at this time.

He was very much opposed to advocating hysterectomy as a procedure to be often advised in these cases without the greatest deliberation and consideration, as his experience had been that many of them went on and delivered themselves normally without any trouble at the full term of gestation, and without any further trouble having ensued. However there were other cases in which a good deal of trouble had been met with. He had seen two cases comparatively recently in which there were sloughing fibroids. In one of them, a septic case, the fibroid was removed. In the other the tumor had sloughed

almost entirely and the woman recovered without any operation. These cases might look very formidable when first seen, and he had in mind a case that he had reported at a local society, in which it was deemed expedient to do a hysterectomy. The uterus was back in the pelvis so that the presenting part of the child could not be felt. Still, within ten days or two weeks from this time the uterus had risen, a great change had taken place, and the head of the child could be felt presenting below, forcing the tumor out of the pelvis, and the woman had thus far gone on without any trouble.

He had occasion some years ago to deliver a woman three times, in whom a fibroid was present on one side, the tumor producing malposition of the uterus, the presentation being a transverse one. This tumor was not recognized at the first labor, but it was at the second one, and it was believed that there was a second child in the uterus, but careful examination disclosed a fibroid tumor. This disappeared and subsequent pregnancy ensued, with transverse presentation again, and all three children were living, as well as the mother, who now had no evidence of a tumor.

Dr. Carstens, in closing the discussion, thought the question of bringing on labor earlier came up in this connection, yet if one brought on premature labor and had retained placenta, it might be necessary to do a hysterectomy afterwards, which would make the case a formidable one. He agreed with Dr. Frank that in exceptional cases these women should be allowed to go on to term, but ordinarily one should operate on them early. There was little danger attached to the operation.

PERSONAL EXPERIENCE IN MYOFIBROMATA OF THE UTERUS.*

BY

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(With two illustrations.)

My object in the present paper is to record some of the more important, salient facts which have been noted in my experience, in the observation and treatment of myofibromata of the uterus.

That many of my earlier operations were done in private houses and at a distance from home without adequate assistance, while I was engaged in general practice, accounts for the fact that the record of this part of my work is imperfect.

While this imperfection makes it necessary for me to speak with

*Read at the Eighteenth Annual Meeting of the American Association of Obstetricians and Gynecologists, at New York, September 19-21, 1905.

less mathematical exactness at times than I otherwise might be able to do, yet I am constrained to think that it will not materially detract from what is offered.

All told my observations cover over 125 cases, more than 100 of which were subjected to abdominal hysterectomy. Only two vaginal hysterectomies for myofibroma were done. Vaginal myomectomy was done in a few cases where removal of the tumor could be accomplished without opening the peritoneum, but I have never opened the peritoneal cavity through the vagina for the removal of myofibromata of the uterus, save in the two cases of vaginal hysterectomy above mentioned. Myomectomy by the abdominal route I have done but six or eight times, except in those cases in which fibroids were removed during celiotomy for other causes, and these are not taken into account in this paper. The remaining cases were not operated.

Hemorrhage has not been as common or as prominent a symptom in my cases as Bishop and others would have us believe it usually is. This is accounted for by the fact that the majority of my cases were of the interstitial or subperitoneal variety. In two cases, only, was hemorrhage in itself of sufficient moment to warrant operation. In one of these cases the metrorrhagia, manifested itself after the menopause had been established, and the woman did not know that she had a tumor until after the examination which revealed an orange-sized submucous fibroid in the posterior wall of the body of the uterus which was removed by morcellation through the previously dilated cervix. In the other case, repeated or rather continuous hemorrhage had produced an alarming anemia in a woman of 47 years. In this case an abdominal hysterectomy was done after two days rest and treatment in the hospital. In several other cases metrorrhagia coming on after the menopause, has been noted as a symptom in these cases, but it was not sufficiently profuse to jeopardize life or health.

Pain has been the most common symptom observed, and this, more often than any other single symptom, was the cause which led to the examination and diagnosis. Especially frequent has been menstrual pain.

In only one case was there an infection of the tubes, and in this case it was the infection which brought the patient to the operating table. A large myofibroma with two pus tubes were removed, and the patient made a slow but good recovery. My experience along this line does not lead me to think salpingitis so

frequent a complication of fibroids as many observers seem to believe.

I have had three cases in which pregnancy was the immediate occasion for the operation. Two of these cases were reported in full in a paper read before the Western Surgical and Gynecological Association at Chicago, in 1901.[1] The other case (Fig. 1), was one of a large (8¼ lbs.) spheroidal tumor springing from the fundus of a uterus four months pregnant. The operation was

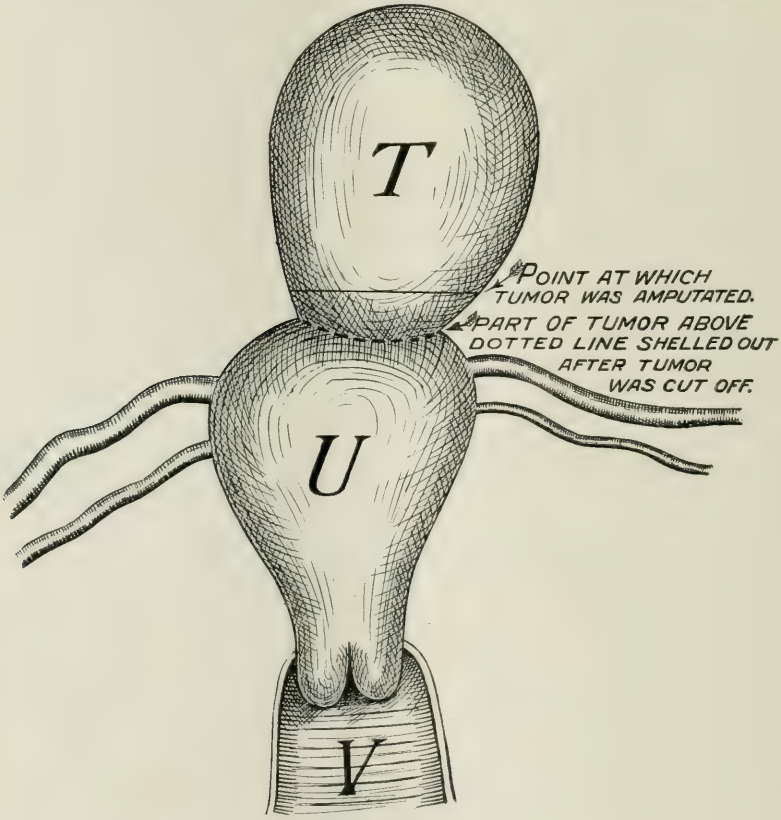


Fig. 1.

necessary to enable the mother to carry her child. She had a normal labor at the end of the gestation period, and has since given birth to a second child. When the previous report of the case was read, the woman had not been confined. I feared, in this case, rupture of the uterus during labor, or inefficient contractions, as the wall was materially damaged at the point of attachment of the tumor, but fortunately neither occurred. The other case, reported in the same paper as the last, first consulted

a physician because of pelvic pain and vomiting. I operated on the ground that she could neither miscarry nor carry the child to term. The specimen (Fig. 2) shows the opinion to have been correct. The third case will be reported in this paper later on. I have had several cases in which miscarriage seemed to be caused solely by uterine fibroids.

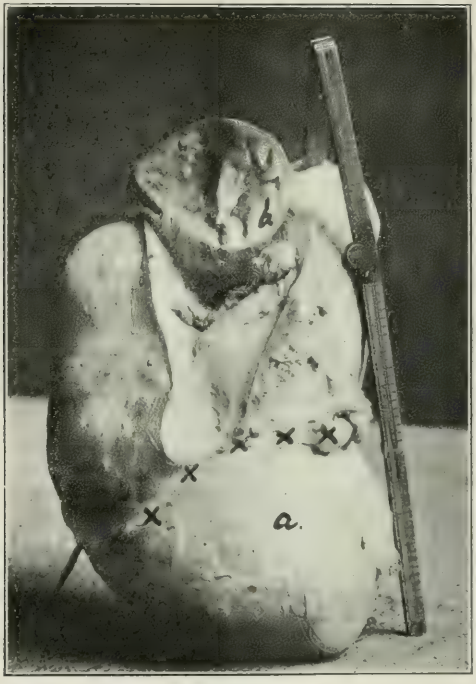


Fig. 2.

Women who have fibroids are peculiarly liable to infection after labor, or miscarriage, or during the menstrual flow, the explanation being that the uterus cannot empty itself well. In several cases this danger of sepsis following labor, miscarriage or the menstrual flow, indicated by the previous history, was regarded by me as being one of the most important reasons for urging operation. As illustrating this class of cases I may briefly report the following:

(1) Mrs. S. had had several attacks of chills and fever which she thought due to la grippe. Suffered from bearing down pains and vaginal discharge. Although but 44 years old and married

18 years, had had but two children, and none for fourteen years. A hysterectomy for myofibroma cured her.

(2) Mrs. B., married three months, miscarriage two weeks before consulting me. For a year had complained of soreness in lower abdomen. Had slight febrile disturbance after miscarriage, which had not entirely abated at time of operation, fifteen days later.

(3) Mrs. N., age 24, married four months, complained of tenderness and pain in pelvis, especially on right side. Had not menstruated for ten weeks. Her attending physician reported that she had been running a temperature of 100 F. for six weeks. On examination there was found some tympany, tenderness of lower abdomen, with a fibroma of the supposedly pregnant uterus. A supravaginal hysterectomy was done, followed by a prompt recovery. Examination of the specimen showed multiple fibroids. The uterine cavity contained a dead fetus, showing slight evidence of decomposition. (This is the case above referred to as "to be reported later.")

While it is quite common for fibroid patients to report rapid growth of the tumor coincident with pregnancy, my observation leads me to think that this rapidity of growth is more apparent than real. That the tumor becomes more apparent and the abdomen enlarges because of the enlargement of the uterus, and not because of the increase in size of the tumor *per se*. On the other hand, it seems quite reasonable to suppose that the great increase in vascularity due to pregnancy would cause these tumors to grow more rapidly in the presence of pregnancy than in its absence.

While partial or complete sterility is a common result of myofibromata of the uterus, I regret to say that in my experience sterility in itself does not seem to worry a large proportion of women to the extent that they consult the surgeon because of it. I have been consulted a few times by women because of sterility due to fibroids, and have done a number of myomectomies in sterile cases, but I am not aware that any of these women subsequently bore children.

Of complicating conditions I have previously related the cases of pregnancy (three cases) and pus tubes (one case) which have come under my observation.

I have record of but one case of malignant degeneration of a myofibroma. This is the case of Mrs. L., age 58, married. One child when nineteen years old, followed by chill and fever. For three years had pain and tenderness in lower abdomen, with slight

vaginal discharge of rather bad odor. A vaginal hysterectomy was done April 4, 1903. The uterus contained one fibroid the size of a hen's egg and several smaller ones. She made a prompt recovery and remains free from return at the present writing. The microscopist reported this as a "myofibroma with sarcomatous changes." Malignant disease coexisting with myofibroma I have not met with. I have had one case of large abdominal fibroid, together with a fibroid of the cervix, so large as to distend the vagina, fill the pelvis and protrude at the vulva. This patient came to me seriously septic with the vaginal tumor breaking down. As the vaginal tumor was too large to be delivered through the pelvis, I did an abdominal panhysterectomy. The patient died from the combined effects of shock, hemorrhage and sepsis. This is the only death I have had, and I feel sure that her life might have been saved by better surgical judgment. The vaginal tumor, which was the source of the sepsis, should have been removed by morcellation, and an abdominal hysterectomy done after the patient had recovered from the first operation. This, together with the case of pyosalpinx duplex, constitutes the whole of my experience with infection as a complication of myofibromata.

As noted previously, I have had three cases complicated with pregnancy. In two this complication was the immediate cause of the operation, and in the third sepsis following the death of the fetus, which was retained, was the immediate cause of the woman seeking surgical relief. Of the other complications I have had one case of myofibroma coexisting with a fibroid of the ovary. This patient was a married woman without children who dated her ill health from a miscarriage which occurred twelve years before she consulted me. Six weeks before she came to me, she began to have pain in the right inguinal region. Operation revealed a fibroid of the right ovary of the size of a fist, and a smaller fibroid of the right cornu of the uterus. Double salpingectomy, right oöphorectomy and myomectomy were done with relief of all symptoms. I believe that the two conditions contributed to the patient's ill health, the fibroid of the uterus was perhaps the cause of the miscarriage and subsequent ill health, except the right-sided pain, which came on later, and was, I think, due to the ovarian fibroid.

In one case of large dermoid cyst of the right ovary, there were several small fibroids studding the uterus which were removed by myomectomy at the same time the cyst was removed.

I have seen but one fibroid which had undergone calcareous degeneration. This was found post-mortem in a patient past fifty years of age, who had died from causes in no way connected with the tumor. The tumor was the size of a croquet ball, and had never given any trouble.

I will mention here a case, because of its comparative rarity, of a tumor the size of an orange, interstitial in location, removed by supravaginal hysterectomy. It was soft on palpation and on section was the color of beefsteak. Microscopically, it proved to be composed practically entirely of muscular fibers.

Personally, I have never removed the ovaries for myofibroma and have treated but one patient who had had this operation done. I saw this woman because of a profuse metrorrhagia a year after the operation. She refused operation for removal of the fibroid, and continued to have hemorrhages frequently for more than a year, submitting at least on one occasion, to a curettage at the hands of a medical friend of mine. Of the further history of the case I know nothing. This experience and that previously related, of cases in which metrorrhagia first manifested itself after the menopause, agrees with that of other operators who regard oöphorectomy for uterine fibroids as unjustifiable, and who do not feel warranted in assuring fibroid patients that their tumors would cease to trouble them after the menopause.[2] Fibroids that are small and giving rise to no inconvenience need no treatment, but if a source of even serious inconvenience they should, in my judgment, be removed, and this is the only method of treatment worthy of serious consideration.

The ideal operation for myofibromata is one which leaves the genital tract intact, and this ideal should be approached in all cases as nearly as circumstances will permit.

Adopting this creed one should not remove healthy ovaries just because the womb must be removed. The tubes should, in my judgment, always be removed in the course of any operation which renders pregnancy impossible. The reason for this opinion is that they are not unlikely to become sources of trouble if left, their removal adds nothing to the risk of the operation, and there is no reason for allowing them to remain.

Personally, I do not acquiesce in the opinion that the cervix should be removed with the body of the womb. To remove the cervix is to deform the vagina, and it predisposes to vaginal hernia. As an argument in favor of its removal, we have the prevention of cervical cancer. In my judgment the latter argu-

ment is not weighty enough to offset the former. My respect for the cervix in a large measure accounts for my preference for the abdominal as compared to the vaginal route in hysterectomy.

Whether to approach myofibromata by the vagina or abdomen, one may usually decide without difficulty before commencing the operation, but the details of the technic should be developed in all cases as the operation proceeds. Whether it is best to work from the top downward on both sides and amputate the uterus after freeing both sides, or to go down one side, amputate the uterus and liberate the other side from below upward, or to bisect the uterus and liberate the halves from below, will depend entirely upon the case in hand. These, together with other details, should be decided after the case has been examined through the open belly.

In some rare cases the operation can be expedited and the loss of blood lessened by the use of an elastic ligature. In two or three cases I have removed a portion of the uterus, together with a large tumor, with the use of an elastic ligature, and finished the operation by ordinary methods. The only accident during the operation that has occurred to me has been injury to the bladder. While opening the abdomen I have cut the bladder, because of its unusually high position, twice. In each case the opening was sutured and the abdomen closed as usual without drainage, no inconvenience being caused by the accident. In one case hemorrhage occurred as a result of a split in the right broad ligament, between the ligature on the ovarian artery and the ligature about the stump. This was among my earlier operations, when the stump was treated extraperitoneally. Silk was used as ligature and suture material until the discovery of the formalin method of treating catgut, since which time catgut has been used exclusively both for sutures and for ligatures. I never had any trouble from the use of silk, but others had, and theoretically it is faulty, hence the change to catgut.

While my experience has been too small to speak with positiveness, yet I am constrained to say that the mortality rate for abdominal operations for myofibromata is higher than it need be. Noble's and Olshausen's statistics, which together include 1,151 cases of supravaginal amputation of the uterus, give a death-rate of 5¼ per cent. My own mortality rate has been less than one per cent., but I have been, perhaps, more than usually fortunate. However, making due allowance, I do not believe that

the rate should be above two per cent. A higher death rate than this would be to me very disheartening.

While my own experience in vaginal hysterectomy has been practically nil, and in vaginal myomectomy through the open peritoneum entirely so, it seems not unreasonable to ask that this route for the removal of fibroids in cases wherein the peritoneal cavity is opened, should show a death rate of not more than one per cent.

REFERENCES.

[1]*Annals of Gynecology and Pediatrics,* February, 1902.

[2]Dr. J. Wesley Bovee has written a very excellent paper on the Development of Fibroids After Removal of the Appendages, which was published in the *Journal* of the A. M. A. May 27, 1905.

47 West Wayne Street.

DISCUSSION.

Dr. Herman E. Hayd, in opening the discussion, said: All were agreed that in the hands of the best operators in this country, the operation of supravaginal hysterectomy was much safer than that of panhysterectomy. In looking over the statistics of various general hospitals in which general surgeons as well as gynecologists had operated, the mortality was given as about five per cent. in supravaginal hysterectomy, and nine to ten per cent. in complete or panhysterectomy. Unless the cervix was involved either in the form of a bad tear or with considerable cystic degeneration, where one might anticipate the possibility of cancer, he thought it was not wise to remove it because it increased the difficulties associated with the operation itself. To remove the cervix took six or eight minutes' additional time, and sometimes the hemorrhage was considerable; therefore, if there were no special indications for its removal, there was no need of removing it.

Dr. Hayd was inclined to believe that there should be no mortality following operations in uncomplicated cases of fibroid tumors, but unfortunately fibroid tumors had associated with them frequently pus tubes, dermoid cysts and other complications, so that of necessity there must be some mortality. However, the mortality incident to the operation, notwithstanding the possibility of all these complications, was very small, providing the work was done quickly and properly.

Dr. J. Henry Carstens said that on general principles Dr. Hayd was correct, and he was inclined to agree with him. He believed in the conservation of organs whenever possible, and had been impressed in the last few years with the importance of leaving ovaries when he did abdominal hysterectomy, but seeing the trouble he had had with some of these women, who had developed ovarian tumors for which they were operated upon afterwards, and who had extensive adhesions which were found at the second operation, he had swung around to his old view,

namely, to remove the uterus and the ovaries, etc., so as to cure the patient. There was no doubt she would have more or less trouble with the menopause. If one left an ovary, she would not have that rapid change. The women would be well. If the woman was young, one could take a chance and explain to her the exact condition, and the speaker sometimes would leave an ovary, with a clear understanding on the part of the patient, and the rule he made for himself was that if a woman was near forty years of age he would do panhysterectomy, but if she was nearer thirty, he would save one of her ovaries.

Dr. Walter B. Chase said the question of operation resolved itself into two factors, first, the location of the fibroid, and second, the size of it. Large fibroids should be removed, because when they reached a certain stage of growth, pressure symptoms were common. Very many subperitoneal and interstitial fibroid tumors, unless they went beyond a certain size, were unimportant, but those which were submucous in character were likely to give trouble.

In regard to bleeding he called attention to the use of stypticin and of hydrastin. One of these agents acted quickly and the other more slowly; they had great power in controlling hemorrhage, thereby conserving patients who refused surgical intervention.

Dr. Francis Reder recalled to mind four cases of fibroid tumors of the uterus in which the bladder was injured; two of the patients died.

The question had arisen with him, when the bladder was injured in the early part of the operation, and when the peritoneum was not opened, if it would not be a better plan for the surgeon to close the bladder wound, put the patient back to bed, and await the results. In the two patients who died from injury to the bladder the peritoneum was opened in both instances. The speaker was present at the operation, and he was in doubt as to whether to continue the operation. He suggested, however, the discontinuance of the operation, to close up the opening in the bladder, and await developments, but the operation was continued in both cases, with fatal results.

Dr. Charles L. Bonifield said every fibroid that caused symptoms should be removed. A fibroid that caused a woman to consult a physician should always be removed, because it was then giving symptoms or she would not go to a physician for examination. He agreed with the previous speakers that the supravaginal operation was the best. It was rare that one saw a large fibroid tumor of the uterus in which the ovaries were perfectly normal. It was not the part of wisdom to leave ovaries that were not normal, and personally he very seldom left the ovaries where the uterus was removed.

In a case in which the bladder was injured he would not advise stopping the operation, but in his judgment a complete operation would be indicated. In the majority of cases where the bladder was injured in operating it was wise to provide for

some sort of drainage, so that if the suturing did not hold the patient would not die from leakage. He had injured the bladder in operating on fibroid tumors, and on ovarian cysts, in some cases, but none of the patients died. He usually provided for vaginal drainage in these cases. He did not remove the cervix, but made a stab wound behind it, and brought the gauze out through that opening, so that leakage would not cause death.

Dr. Joseph H. Branham said that he did panhysterectomy in most of these cases since he began operating. He began to do this because, after watching other operators' work, he knew they had trouble with the stump of the cervix, and years ago patients died from hemorrhages and from other troubles from leaving the stump. When he began to operate he made up his mind that he would not leave any stump. He saw no objection to taking out the cervix when the uterus was removed, as it did not add any danger to the operation. It probably took a little longer to treat the stump, as it was treated at the present time, but not as long as it did a few years ago. When possible, he made a vaginal incision, freed the cervix if it could be brought down, and then went in above and took out the whole thing. He did a vaginal hysterectomy if it could be done, if the tumor was not too large to injure the surrounding organs. His experience in operating on these cases embraced forty cases, and of this number he had lost but one. The patient did not die, however, as the result of an injury to the bladder. He was not able to obtain a post-mortem examination. This was a case in which hemorrhage was profuse, and the patient had very little blood when operated upon. Evidently she had lost more blood before than she did during the operation. The bladder was opened while he was separating the anterior part of the uterus through the vagina. The hole was closed up and there was no leakage from it, as far as could be determined. There was no sign of any discharge of urine from the vagina, and catheterization brought clear urine. But this patient died four days after the operation suddenly, with symptoms of collapse, but he had no way of verifying the cause of death, as he could not obtain an autopsy.

As far as operating on all cases was concerned, he did not think any surgeon would advocate the pursuance of that course. The tendency of these fibroids was to bleed, and secondary degenerative changes, either malignant or otherwise, followed a large proportion of fibromata that were left in the uterus.

Dr. J. Henry Carstens asked the last speaker what his experience had been with reference to shortening the vagina, and with premature atrophy of the vagina after the removal of the cervix. He thought that this occurred a great deal more where the cervix was not left than in those cases where it was left.

Dr. Branham replied that theoretically there might be something in this point, but he had never had a patient who complained of any trouble after panhysterectomy, with the

removal of the cervix, although there might be such cases. He had never had one, however, who had complained of any inconvenience.

DR. PORTER, in closing the discussion, said there were one or two points he desired to speak about, one of which was the removal of the ovaries. The question had been asked why one should leave an ovary when he removed the uterus. He would answer this question by saying, "Ask the woman why." One did not hear a woman complain of her vagina. These women suffered intensely and for a long time before they made a complaint. He did not see any more reason for removing an ovary because the uterus was removed than for removing a man's testicle because we had taken away the dilated veins that accompanied the vas deferens. He did see good reason for leaving it there.

At this juncture the *Second Vice-President*, Dr. JOHN YOUNG BROWN, took the Chair, and the *President*, Dr. HOWARD W. LONGYEAR, of Detroit, Michigan, delivered his address, which was entitled

A STUDY OF THE ETIOLOGY OF FLOATING KIDNEY, WITH SUGGESTIONS CHANGING THE OPERATIVE TECHNIQUE OF NEPHROPEXY.

(See original article, page 625.)

UNUSUAL DILATION OF CORNUAL BLOODVESSELS: RUPTURE INTO UTERINE CAVITY: HYSTERECTOMY: RECOVERY: REPORT OF A CASE.

BY

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(With plate.)

A SUDDEN, severe and spontaneous gush of fresh blood from the uterine cavity usually means the rupture of a bloodvessel. During the child-bearing period, the partial or complete separation of fetal membranes constitutes the most frequent cause; less often it comes from an excessive area of vascular endometrium.

Later in life such hemorrhages usually result from rupture of immature malignant blood channels or ulceration into large uterine vessels. A few other types of pathology occasionally stand in causal relation to sudden serious bleeding from the uterus. One of the rarest among these is spontaneous rupture of large, vari-

*Read at the Eighteenth Annual Meeting of the American Association of Obstetricians and Gynecologists, at New York, September 19-21, 1905.

cose veins, which have their tortuous course within the substance of the uterine wall.

In the presence of pregnancy, fibroid tumors, sarcoma, etc., the blood channels are often greatly dilated. Under ordinary conditions, however, those vessels found within the uterine wall are singularly free from aneurysm and varicosities. This is probably due, as Findley points out, to the elastic pressure the uterine musculature normally gives its vessels. The great frequency with which varicose veins occur in the loose connective tissue of the broad ligaments would give support to that view.

A recent case of varicose veins situated within the uterine muscle at the right cornu is so typical that it seems worthy of record.

Mrs. X., aged 45, was a vigorous girl of active habits. She has had no illness of consequence for many years, until acute catarrhal fever last January, and pneumonia for five weeks in January and February, 1905.

She was married 15 years ago, is the mother of 3 children and has had 4 miscarriages. Her last miscarriage occurred 4 years ago and her last child is 20 months old.

Menstruation began at 15. Her periods recurred at intervals of 28 days; have been rather profuse, have lasted 5 to 7 days, and always showed a tendency to return in the event of excessive exercise. Menstruation was never painful until the beginning of her recent illness.

She did not menstruate from the time of her last conception until March 1, 1905. At that time she had severe pain in the region of the right cornu, lost a little blood for a day or so. Three days later, March 5, without pain or warning of any kind, she suddenly lost a pint or more of fresh red blood. She gained strength quickly, but remained in bed for a week.

Second Hemorrhage.—She did not bleed again until April 7. She spent some time shopping April 6. The next day, while resting, she bled furiously for a short while—without pain or warning of any kind. She lost more than a pint of fresh blood in a very few minutes. Bleeding ceased almost as suddenly as it began, and she lost no more blood until April 30.

Third Hemorrhage.—April 30, she was annoyed by a feeling of fulness in the pelvis, while walking a short distance. She was quiet the remainder of the day until 5 P. M. when, while sitting quietly, she again suddenly bled furiously, and was put to bed, very pale and very weak.

The following day Dr. Pershing prepared to wash the flabby

uterus with very hot water with the hope of causing it to contract firmly, and thus prevent a repetition of her recent experiences.

He had scarcely begun, when a stream of blood hissed out. She lost more than at any previous time, and looked almost bloodless. It was with extreme difficulty that he succeeded in keeping her alive during the next day or so.

I first saw her with Dr. Pershing, May 7, one week after her last hemorrhage. She was still markedly anemic and very weak. The next day she was transferred to the Allegheny General Hospital in order to insure speedy action in case of another hemorrhage. Fortunately it did not occur, and she was allowed to regain much blood and considerable strength. The day she entered the hospital her blood showed:

Hemoglobin	60%
Red blood cells per cu. mm.	3,260,000
White blood cells per cu. mm.	6,000

An examination two days before the operation showed:

Hemoglobin	65%
Red blood cells per cu. mm.	3,800,000
White blood cells per cu. mm.	7,540

Before leaving the hospital she had:

Hemoglobin	75%
Red blood cells	4,100,000
White blood cells	9,100

Her strength and general health had improved correspondingly. When seen one week ago, she said she felt perfectly well. She was found to be normal in every respect.

Operation.—May 31, 1905. Ether, 4½ ounces. Vaginal hysterectomy, clamp method, 40 minutes. There were no technical difficulties, though bleeding from each slight injury to the uterus was profuse. In fact, it became alarming while the fundus was being delivered. At each grasp with volcella forceps, the blood poured out as from a squeezed sponge. It promptly ceased when the fundus was delivered. She left the table in good condition. Convalescence was normal in every way.

Gross Pathology.—The uterus, 8.5 cm. long, 6 cm. wide and 4 cm. thick, was opened by slitting the anterior wall from cervix to fundus, and from this line (one inch below its upper end), to the cornu on each side.

In the right cornu the knife opened into a varicose vein 2 cm. in diameter, containing a blood clot 1.5 x 1.3 x 6 cm. in diameter. Closer inspection showed that this clot protruded partially into the free uterine cavity through an opening in the vein. This opening

was 4 mm. in diameter. The clot served as a plug completely closing the rent.

In the immediate vicinity, several other veins measuring 4 to 6 mm. in diameter were severed, and their curled lips pouted. They could be traced to cavities of considerable size.

From one end of the uterus to the other, the cut surface was studded by a large number of bloodvessels, which stood out above the surface, strongly suggesting sclerotic arteries.

The uterus was soft and flabby.

Microscopic Examination.—By Dr. Elizabeth S. Moore, confirmed by Dr. Simon Flexner.

Specimen consists of sections from the uterine wall.

Mucous Membrane.—The surface epithelium consists of the usual single layers of cylindrical cells. The glands are somewhat hypertrophied, in many places showing convolutions. The interglandular *stroma* appears normal.

Musculature.—The thickness of the uterine wall just below the entrance of the left tube is 19 mm. In section the picture presented resembles that of a uterus undergoing the process of involution.

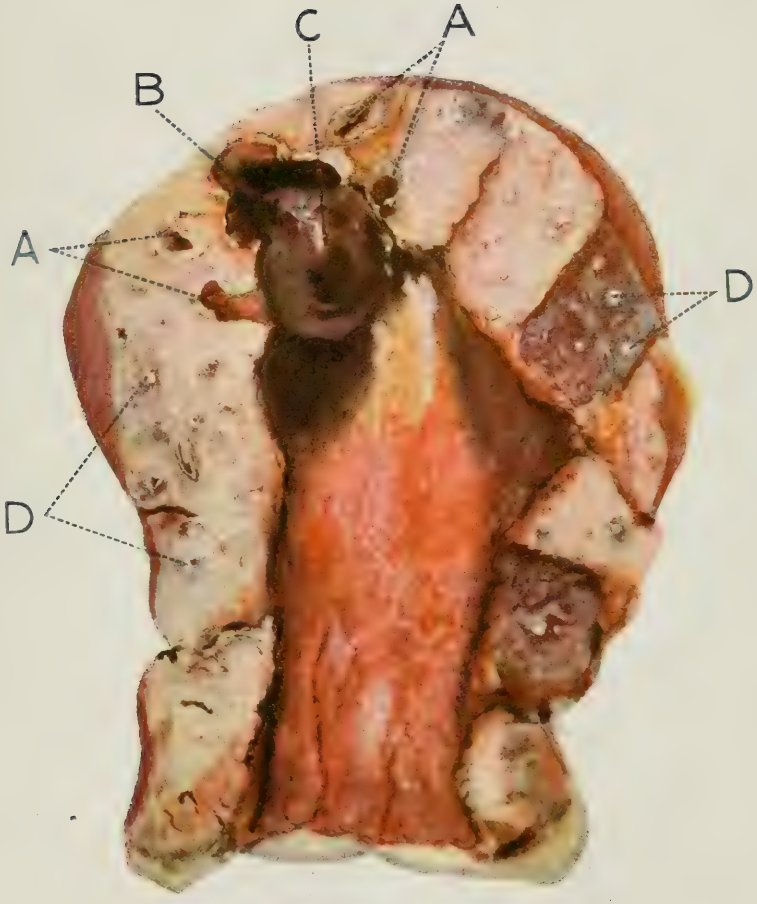
Bloodvessels.—The vessels in the walls of the uterus are increased in size. In many the lumina are much dilated, in others the lumina seem smaller than normal, but the walls of these vessels are thickened. The intima of the arteries shows proliferation. In some the proliferation extends around the whole vessel wall—an obliterative endarteritis. In others, the intima shows a nodular proliferation, involving only a part of the circumference, a nodular endarteritis. The musculature of some of the vessels appears decreased. In most such cases the intima shows a correspondingly increased proliferation. In a few, however, the intima was not proliferated and the vessel wall at such a point is thin.

The vessels in the right *cornu* especially show dilatation and endarteritis. Section through ruptured vessel shows proliferation of intima with degeneration of its cells. In the tissue surrounding the vessel there is an abundant infiltration of small round cells.

Remarks.—It would appear that in this instance we have an excessive vascularity of the uterus, with sclerotic arteries and varicose veins.

The sclerosis is found in its several forms, varying from a slight nodular infiltration of the intima to complete obliteration. In addition, we have the unusual spectacle of greatly dilated varicose

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AND
DISEASES OF WOMEN AND CHILDREN.
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DILATATION OF CORNUAL BLOOD VESSELS—*Simpson.*

A—VARICOSE VEINS.
B—VARICOSE VEIN WHICH RUPTURED INTO THE UTERINE CAVITY.
C—BLOOD CLOT 15 X 13 X 6 M.M. PARTLY WITHIN VARICOSE VEIN AND PARTLY WITHIN UTERINE CAVITY.
D—SCLEROTIC ARTERIES.

veins, which were the subject of repeated spontaneous rupture with repeated spontaneous closure.

We also have a clinical picture which portrays the perils of this disease in its most serious form. In the well-marked cases that have come under my observation, arteriosclerosis of the uterine vessels has been accompanied by menorrhagia and metrorrhagia which began between the ages of 38 and 45. They grew more and more pronounced, have resisted medicinal and minor surgical measures, finally endangered life, and have yielded only to hysterectomy.

In this case, however, the first symptom was a furious hemorrhage, due to rupture of a large varicose vein into the uterine cavity. Within two months three other hemorrhages burst upon her without warning, and each imperiled her life.

The gross pathological findings make it clear that without surgical intervention, hemorrhage or infection would inevitably have closed the scene within a short while.

524 Penn Avenue.

DISCUSSION.

Dr. Charles Greene Cumston said that the case reported by Dr. Simpson was unique of its kind, and opened up the broad question of the symptom hemorrhage, in diseases other than malignant of the uterus, and of fibroids. The only point to which he would call attention was hemorrhage of a serious nature, namely, metrorrhagia occurring in chronic Bright's disease. This subject had been written about considerably of late by French observers, and he desired to call attention to the arteriosclerosis which we naturally got in Bright's disease and the symptom hemorrhage.

Dr. Oscar H. Elbrecht reported a case which he thought was similar to the one narrated by Dr. Simpson. He had studied the case very carefully since, but did not do a hysterectomy to find out the exact pathology. The patient had endometritis and came for curettement. The uterus was enlarged; he curetted it with a small sharp curette. Within a minute or so after he began, the hemorrhage was profuse, and nothing but a Paquelin controlled it. A stream of blood about the size of a small lead pencil came from the uterus. He curetted away all bleeding tissue, but the hemorrhage was so free that it was necessary to pack. He thought the pathology in his case was precisely similar to that mentioned by Dr. Simpson.

Dr. Simpson, in closing the discussion, emphasized the point brought out by Dr. Cumston, that in chronic Bright's disease, with general arteriosclerosis we not infrequently had excessive hemorrhage from the uterus. His was a case, however, in which there was no renal involvement. He had seen a few other cases in which the kidneys did not appear either chemically or microscopically to be involved.

"PRIMARY BOWEL RESECTION *vs.* ARTIFICIAL ANUS IN THE TREATMENT OF STRANGULATED HERNIA, WITH REPORT OF SEVEN CASES."*

BY
JOHN YOUNG BROWN, M.D.,
St. Louis, Mo.

(With one illustration and plate.)

THE modern radical operation for uncomplicated hernia is almost an ideal procedure. With a *nil* mortality and less than two per cent. of recurrences, it is unfortunate that surgeons should be called upon to deal with the results of long-standing strangulation. The mere existence of hernia is a strong indication for operation; in the presence of strangulation, taxis and temporizing is little short of criminal. It is my purpose in this paper to limit myself to a discussion of the surgery of those neglected cases of hernia in which at the time of operation the intestine found in the hernial sac is so damaged that the operator is forced to resort to one of two procedures; the establishment of an artificial anus or a primary bowel resection. The mortality in such cases is still too high. In 332 cases collected by Gibson[1] 128 males, 209 females, the mortality was 28.6 and 39 per cent. respectively. Hofmeister[2] reports 25 cases of primary resection with a mortality of 40 per cent. The statistics of Von Bramman show a mortality of 46.6 per cent. in 68 cases following the establishment of artificial anus. To this of course, must be added the secondary mortality which must necessarily follow as the result of efforts made to reestablish the intestinal continuity. If the relative merits of these two procedures are to be judged in the light of statistics there is little to choose between them. From a surgical point of view quick clean bowel resection has much to commend it. A fairly large experience has convinced the writer that the cases in which the establishment of an artificial anus is indicated are few, and that this operation is only justified when the patient is bordering on the moribund state. During the last eighteen months I have operated upon seven cases of strangulated hernia; four of these were males, three females. In four the hernia was of

*Read at the Eighteenth Annual Meeting of the American Association of Obstetricians and Gynecologists, at New York, September 19-21, 1905.

the inguinal variety and in three of the femoral type. In all primary resection was done, followed by a radical operation at hernial site. Of the seven cases six recovered and one died. The oldest patient was seventy years, the youngest twenty. The duration of strangulation, longest fifty-seven hours, shortest nine hours. Amount of gut removed, largest four feet, smallest eight inches. Portion of gut involved small bowel. In each case the condition of bowel was such as to leave no question concerning the advisability of its removal. In all the resection was done through a supplementary abdominal incision and the anastomosis was made with the Murphy button. The results obtained I attribute to the careful attention to certain points in the operative technique, a neglect of which I believe has been responsible for the high mortality invariably accompanying the surgical treatment of this condition. The operative technique employed by the writer is practically as follows:

When a patient enters the hospital with a strangulated hernia no effort is made to reduce it by taxis or temporizing methods. Preparation is immediately made for operation. This consists of the usual shaving and scrubbing, to which is added a careful stomach washing with water as hot as can be borne. This later procedure is important as it rids the organ of the filth resulting from the retrograde peristalsis always present in such cases. As soon as the preparations are completed the patient is anesthetized; general anesthesia is preferred. For ordinary hernia work local anesthesia can be used with comparative satisfaction, but where distended bowel has to be dealt with and extensive resection is contemplated, general anesthesia is safer and far more satisfactory. The classical incision is made at hernia site and the sac is reached and opened in the usual manner. Before attempting to relieve the constriction the sac is carefully cleansed with hot saline solution. This prevents leakage of septic serum from the sac back into the peritoneal cavity. The constriction is now relieved. If the gut responds and its viability is beyond question it is returned and one of the ordinary radical operations for hernia is proceeded with. If on the contrary it is deemed advisable to resect, a supplementary median abdominal incision is quickly made. By a careful distribution of gauze the bowel can be delivered through this incision with ease and without soiling the peritoneal cavity. The gut being delivered, the operator has full command of the field.

In resecting bowel for this condition there are three important

points to be observed: first, the resection should extend well back into healthy tissue; second, the distended bowel above the constriction should be drained of its highly septic contents; third, the work should be done with the greatest possible dispatch. By means of the drainage apparatus which I exhibit (Fig. 1) this work is greatly facilitated. The drain consists of a medium sized glass drainage tube to which is attached a long rubber hose. The method of its application is as follows:

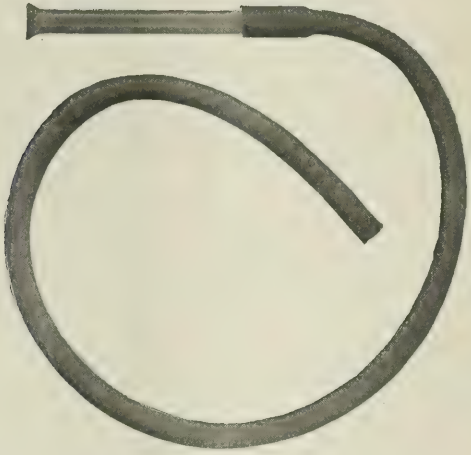


Fig. 1. Intestinal Drain Tube.

The extent of the resection having been determined, the bowel is clamped on either limit of the section to be removed. The clamp on the proximal end being placed three or four inches above the point of resection, the gut is now stripped of its contents and a second clamp is placed at the point of proposed incision, the bowel is now incised above this clamp and the drainage tube is placed in its lumen, being retained there by a silk ligature passed through mesentery and around the intestine. The end of the incised bowel is surrounded with gauze to prevent soiling of the field, the clamp above the drain removed, and the bowel allowed to empty itself through the tube into a receptacle under the table, while the operator proceeds with the resection. (See plate.) The mesentery is now quickly ligated and the damaged segment of gut removed and half of the Murphy button is now placed in the distal gut. By the time this is accomplished the drain will have served its purpose; the clamp is again placed above the drain and the drain removed.



DRAINAGE OF BOWEL DURING RESECTION FOR STRANGULATED HERNIA—*Brown*

The other half of the button is next inserted and the anastomosis completed. As the drain works with the operator much time is saved and one of the most important steps of the operation is accomplished, namely, the thorough removal of gas and septic bowel contents, without loss of time and with no soiling of the surrounding tissues. The bowel is now washed off with hot saline and returned. A heavy gauze pad is placed in median wound to protect the intestines while the radical operation at hernial site is completed. This accomplished, the general peritoneal cavity is copiously irrigated with hot normal salt solution, a glass drainage tube is placed in the vesico-rectal pouch, the median wound closed with through-and-through sutures. The patient is now returned to bed and as soon as possible thereafter is placed in the exaggerated Fowler position.

The after treatment is simple. Nothing is given by mouth for forty-eight hours. Saline enemas are administered every three hours to which an ounce of liquid beef peptonoids is added. If the condition of the pulse should indicate, strychnine and hypodermoclysis is resorted to. Morphine is never used if it is possible to do without it. The drainage tube is generally removed at the end of twelve or twenty-four hours.

Remarks.—I am well aware that the operation as above described is open to strong theoretical objections. The danger of infecting a clean peritoneal cavity while delivering a loop of infected bowel through a supplementary incision at once suggests itself. The results obtained in the cases reported tend to prove that this objection is not well taken. If this danger is eliminated, the advantages of the method at once become apparent. These advantages are many. In the experience of the writer it has been found that in many cases of strangulated hernia the damage to bowel does not stop at the limit of the hernial constriction but that it frequently extends far beyond, and that the pelvis and small bowel as a rule will show evidence of beginning peritonitis. Case 5 illustrates this point very forcibly. In this patient about two feet of ileum, black and necrotic, was found in sac. After releasing the constriction it was found on opening the abdomen that the gut and mesentery were widely involved; pelvis contained much turbid serum, resection to the extent of four feet being necessary. Through a median incision quick wide resection was done, followed by a careful peritoneal toilet which could not have been made had the resection been attempted at the hernial opening. Regarding the advisability of irrigation and drainage, this is a matter

that the individual operator must determine. Personally I have found that a copious flushing of the abdominal cavity acts as a powerful stimulant, and as stimulation is generally needed in cases of this character, irrigation is uniformly done. In all of the cases here reported the pelvis was drained.

CASE I.—George Love, colored, male, aged 24, admitted to St. Louis City Hospital February 3, 1904, suffering from a strangulated inguinal hernia of right side. Hernia had been down for 24 hours. At operation 10 inches of black necrotic ileum was found in sac. Eighteen inches of gut was resected, anastomosis made end-to-end with Murphy button. Button passed on 11th day. Recovered.

CASE II.—Elizabeth Pierson, white, female, age 54, admitted January 6, 1904, with strangulated femoral hernia of left side. Hernia had been down 30 hours. At operation about 4 inches of gangrenous ileum was found. Resection done; 8 inches of small bowel removed; anastomosis made end-to-end with Murphy button. Button passed on 23d day. Recovered.

CASE III.—Catherine Benecke, white, female, age 70, admitted to hospital February 15, 1904, with a strangulated femoral hernia of left side. Hernia had been down for 16 hours. At operation 7 inches of gangrenous ileum was found in sac. Ten inches resected, anastomosis made end-to-end with Murphy button. Button passed on 10th day. Recovered.

CASE IV.—David Robinson, colored, male, age 20, admitted to hospital January 21, 1904, with strangulated inguinal hernia of right side. Hernia had been down 14 hours. Eighteen inches of black necrotic bowel found in sac. Twenty-four inches removed. End-to-end anastomosis with Murphy button. Button passed on 8th day. Recovered.

CASE V.—John Newman, white, male, age 57, admitted to hospital March 28, 1905, with a large strangulated inguinal hernia of right side. Hernia had been down for 12 hours. At operation about 2 feet of badly damaged bowel was found in hernial sac. On opening abdomen mesentery was found badly thrombosed; thrombosis extended 8 or 10 inches below and above constriction. Four feet of ileum was resected; end-to-end anastomosis with Murphy button. Button passed on 23d day. Recovered.

CASE VI.—John Clark, white, male, age 23, admitted to hospital June 6, 1905, with a strangulated inguinal hernia of right side. Hernia had been down 14 hours. At operation 2 feet of gangrenous ileum was found in hernial sac. Mesentery

badly thrombosed; thrombosis extended well back above and below constriction; 3 feet of ileum resected; end-to-end anastomosis with Murphy button. Button passed on 26th day. Recovered.

CASE VII.—Lizzie Schuett, white, female, age 44, admitted to hospital August 21, 1904 suffering from a strangulated femoral hernia of the right side. Hernia down 57 hours. This patient was in a very bad condition on admission. At operation a loop of gangrenous ileum and sloughing omentum found in sac. Widespread peritonitis present. One foot of small bowel resected; anastomosis made end-to-end with Murphy button. Patient died 36 hours after operation from diffuse peritonitis.

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CITY HOSPITAL.

DISCUSSION.

DR. JOHN B. DEAVER, of Philadelphia, said he endorsed practically all Dr. Brown had stated. He thought the teaching of taxis in cases of strangulated hernia was similar to the teaching of the medical treatment of appendicitis, and the reason why there was such a large mortality in cases of appendicitis was because the scalpel of the surgeon was not administered immediately the diagnosis was made. The reason why there were so many deaths from strangulated hernia was because professors throughout the country were still teaching taxis, and he thought so long as this obtained, just so long would the death rate in these cases be kept up. It was his principle to immediately anesthetize the patient, with the understanding that if he failed to reduce the hernia with gentle taxis, then to operate.

As to Dr. Brown's method, he endorsed it practically with one or two exceptions. He did not use now any mechanical appliance, and the fewer instruments he used the happier he was. His assistant held the bowel with a piece of gauze, and with a pair of scissors he made the excision. He never used the Murphy button, but needle and thread. He did end-to-end anastomosis. He rarely made supplemental incisions, and never in the inguinal variety of hernia. He simply enlarged the wound. In the femoral variety of hernia it might be necessary to open the abdomen above Poupart's ligament. While he did not drain, he thought this was an excellent suggestion on the part of the essayist. After having done his resection and end-to-end union, the bowel was slipped back and a piece of gauze left in the end of the wound and brought in contact with the bowel at the site of the union.

Dr. Theodore McGraw, of Detroit, Michigan, by invitation, said he had been interested in the subject under discussion for several years, and he demonstrated the application of the elastic ligature in these cases.

A weak point in the operation described by the essayist, he thought, was the making of a large incision. Here we had a septic condition of the wound, and notwithstanding the greatest care taken it might be difficult to render it perfectly aseptic, and when one had a large wound under such conditions he was very apt to have imperfect union, and more or less hernia. However, when a method had been so successful as the one described by Dr. Brown, one should not criticise it too much. It was only rarely that they had cases of strangulated hernia in Detroit, as they had taught the profession better. Occasionally he saw a case of gangrenous hernia, but these cases did not come under observation now as they did formerly. He would not apply taxis when a patient came with a hernia, but would make a radical operation as soon as possible. This was the way they did in Detroit in all cases, and he agreed with Dr. Deaver that the teaching of taxis ought to be done away with entirely, and that surgeons ought to make the radical cure operation in every case.

Dr. J. Henry Carstens confined his remarks largely to the use and value of the McGraw elastic ligature, and said that men like Ochsner, who had used the ligature in a great many cases, considered it one of the simplest things for short circuiting the bowel for all kinds of cases. He did not see the necessity of making a supplemental incision, as the essayist had recommended, as he thought this afforded another chance for infection of the bowel. He concurred in what Dr. McGraw had said with reference to the rarity of cases of strangulated hernia in Michigan and stated that it was now eight or ten years since he had his last case.

Dr. Henry Howitt, of Guelph, Ont., stated that five years ago he was called to see a prominent man in his district, a Yorkshireman, 81 years of age, who had led a medical attendant astray in regard to the nature of his case. He had intestinal pain and had vomited. His great complaint was that he could not eat. On examination he found a large scrotal hernia. He learned that this had existed for years. Operation was advised, consented to and performed, and at the operation over two feet of intestine was found to be gangrenous. This was removed, and an end-to-end anastomosis made by means of the Murphy button. The sac was only partially removed. The wound was not closed, but packed with gauze. The button was passed on the ninth day, and the patient made a complete recovery, without a single untoward symptom. Two years later he removed calculi from this man's bladder, and at the same time closed the hernia which had resulted from the former operation.

Dr. Louis Frank agreed with everything that the essayist

had said. Last year, at the meeting of the Association, held in St. Louis, he brought out the point of supplemental incisions. He could not see the advantage of withdrawing clean bowel through a dirty, infected, hernial sac, and then replacing it, when we could do the work through a clean supplemental incision. Where it was necessary to cleanse the general cavity, he thought he could do it much more thoroughly through a supplemental incision than he could through the hernial opening. itself. He had seen small hernia reduced *en bloc*, sac and all, and had to open the abdomen afterwards to relieve the constriction, doing a resection of the gangrenous gut. He did not believe there was any place for taxis.

DR. BROWN, in closing the discussion, stated that surgeons should make every effort to do ideal work. The worst cases that the surgeon was called upon to deal with were secondary cases.

The use of the McGraw ligature was a valuable procedure, with certain limitations. He had used it a number of times. in stomach surgery with satisfaction, and more particularly in those cases of advanced malignancy where it was necessary to do a quick gastroenterostomy, and he thought that the method of Dr. MrGraw was far better than the use of the Murphy button.

In regard to the use of mechanical devices, he agreed with Dr. Deaver that in all cases where it was possible to use the suture it should be employed, but he had never been able to cultivate sufficient skill to make an end-to-end anastomosis as quickly with the suture as with the button.

INTESTINAL OBSTRUCTION.*

BY

LEWIS C. MORRIS, M.D.,

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(With two illustrations.)

INTESTINAL obstructions offer an usually attractive field to the abdominal surgeon at the present time on account of the large mortality shown by statistics in the past and because this mortality theoretically should be reduced to nil (excepting, of course, those cases caused by malignant growths), if the appropriate treatment be adopted at the proper time. So grave has been the outlook for these cases in the past that the term "locked bowels" carries to the mind of the average layman even to-day the idea of almost certain death. This is one of the chief reasons for the strong opposition which so frequently confronts

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the surgeon when operation for the relief of this condition is advised.

This high mortality rate can only be explained by the fact that operations are too frequently delayed until a time when the resistance and vitality of the patient has been so lowered by toxic absorption, and pathological changes have progressed to such an extent that recovery is impossible. This delay in operating for the relief of ileus is due to one of two things. First, assuming that a diagnosis has been made, the adoption of expectant treatment with the hope that this treatment will relieve the condition or that spontaneous recovery will follow; or, second a delay resulting from a failure to establish a positive diagnosis.

It is, I think, unnecessary to enter into any discussion of the unwisdom of pursuing an expectant treatment after the diagnosis of ileus has been made, for the cases of intussusception and volvulus which recover spontaneously or respond to any treatment other than operative constitute the rare, the very rare, exceptions, and in the prosecution of this treatment precious time may be lost, adding material jeopardy to the operation which becomes imperative later on.

The delay in establishing a positive diagnosis, and the consequent delay in operating, probably contribute more to the high mortality than any other factors. A large percentage of these cases present classical symptoms which preclude the possibility of doubt as to the nature of the trouble almost from their very incipiency, but on the other hand there are also a considerable number of cases in which the diagnosis within the first twenty-four or forty-eight hours is by no means clear, and it is in the management of this latter class that we must look for the improvement in our statistics. In order to bring the matter of symptoms and diagnosis more clearly before you, I beg to report six cases which have come under my care within the last ten months.

Case I.—Miss T., age 12 years. I first saw this patient at 8 P.M. October 28, 1904, in consultation, and received this history: patient had been in excellent health prior to eleven days before, when there had developed suddenly an intense abdominal pain, associated with violent nausea and vomiting. This poor little girl was a member of a family who were disciples of Christian science, and her sufferings had been without any alleviation whatever, except the scant solace which may have been afforded her by the prayers of the prophets of her father, until two hours before I saw her. At this time her con-

dition had become so alarming, that at the advice of the "healer" a physician was called. During the whole eleven days the pain, nausea and vomiting had continued without remission, no nourishment or fluid of any kind had been retained for longer than a few moments at a time, and there had been no bowel movement, except the emptying of the lower bowel which was accomplished on the second day by an enema administered clandestinely by an "unbeliever" who was staying in the house.

Subsequent enemata had been ineffectual. At the time I saw her the pulse was 140 and weak. Temperature 100½. The upper abdomen was decidedly tympanitic, but this condition was distinctly less marked below the umbilicus. The eyes were hollow and injected, and the expression was an admixture of anxiety and despair. The attending physician had made a diagnosis of a high intestinal obstruction, which I verified, and an immediate operation was advised as a desperate chance and almost as a forlorn hope. Two hours later I operated at the Hillman Hospital under chloroform anesthesia. Between the time I first saw her and the beginning of the operation, strychnia hypodermically had been administered freely, and the subcutaneous injection of normal salt solution was begun synchronously with the operation. An incision was made in the mid line, beginning one-half inch below the ensiform cartilage and extending to within an inch of the umbilicus. On opening the peritoneal cavity a large amount of clear serous fluid escaped and the coils of intestines above were observed to be quite considerably distended. Not so much so below. A rapid examination revealed an internal strangulation of a loop of the jejunum in the foramen of Winslow. The constriction was relieved and the loop of gut liberated without difficulty. The circulation returned rapidly to the portion of intestine which had been strangulated, so the cavity was hurriedly flushed with salt solution and the incision closed by interrupted silk worm sutures, leaving about a liter of salt solution within the cavity. The pulse was distinctly better at the close of the operation than when it was begun. Recovery from the anesthetic was prompt, there was no recurrence of the nausea and vomiting, and flatus was passed freely per rectum. About fifteen hours after the operation the pulse became weaker and more rapid, and death followed six hours later from exhaustion, despite all efforts to stimulate hypodermically, and to nourish per rectum.

This was a case in which an early diagnosis could have been made without difficulty, and in which an early operation would

certainly have been attended with success. It is interesting to note that this strangulation, which had existed for eleven days, producing such grave constitutional symptoms, did not destroy the integrity of the strangulated gut.

CASE II.—Mrs. C., age 36. Health had been perfect until the night of December 3, 1904, when there was a sudden onset of severe abdominal pain, with nausea and vomiting. Temperature was subnormal, and pulse 96. A hypodermic of ¼ grain of morphia afforded only slight relief, and despite the administration of a potent cathartic, obstipation was complete. Enemata given on the morning of the 4th were ineffectual, and the nausea and vomiting continued in paroxysms. Temperature remained subnormal, and pulse 100. The pain at this time was referred principally to the right iliac region, there was a slight rigidity, but nothing definite could be made out. Fifteen hours after the beginning of the attack there was a leucocytosis of 9,000 plus. There was no history of any previous attack of appendicitis. A diagnosis was made of a probable appendicitis and an immediate operation advised. I operated twenty hours after the beginning of the attack and found a volvulus of the ileum near the ileocecal junction. There were no adhesions and the appendix was perfectly normal. This patient made a prompt and uninterrupted recovery.

The point in this case is whether I should have operated as early had the site of maximum pain been elsewhere than in the right iliac region, and I wish to affirm that in such a condition as this, the indications for operation are positive, regardless of the location of greatest pain.

CASE III.—Mrs. S., age 38. Seen in consultation on January 4, 1905. Had had for several years an enlargement just below the left groin, which would at times become painful. Had been told that this was an enlarged gland. Five days before I saw her, after eating a hearty meal of rather indigestible food she was taken suddenly with intense pain over the region of the tumor, became nauseated and began vomiting. Within a few hours the pain assumed a colicky paroxysmal character and involved the whole of the abdomen. Her physician was called, morphia given hypodermically and a cathartic prescribed.

On the following day the bowels acted fairly satisfactorily, but the enlargement below the groin continued to be exceedingly painful. Hot poultices were applied and on the following day, three days before I saw her, her physician states that there was redness and pitting on pressure over the tumor. An aspirating

needle was inserted at this time into the tumor and a few drops of reddish brown fluid withdrawn. Following this, the paroxysms of pain became more intense, and nausea and fecal vomiting became almost incessant. When I saw her the pulse was 130, temperature 100. Abdomen considerably distended and generally sensitive. A diagnosis was made of strangulated femoral hernia, and operation was performed at the patient's residence an hour later. The tumor was found to consist of a punctured knuckle of gut, a process of omentum, offensive fecal fluid and pus. There were firm adhesions, shutting off the cavity of the sac from the general peritoneal cavity.

Both gut and omentum were gangrenous. The opening in the gut was caught and held with a pair of clamps, so as to prevent leakage, and after cleansing the wound as carefully as possible, the omentum was resected. Another incision was made above Poupart's ligament, and after breaking up adhesions the necrotic gut was brought out through this latter opening and twelve inches resected. As the patient's condition was exceedingly ragged at this time, a rapid anastomosis was made by means of a Murphy button, and two drainage wicks were left in; one in the opening above and the other below Poupart's ligament. The recovery was uneventful, except that on the fifth day after operation the patient experienced a rather acute sharp abdominal pain, which she said she knew was due to the slipping of the button. On the dressings that night there was a distinct fecal discharge, which kept up for forty-eight hours, after which there was no further trouble.

CASE IV.—Mrs. G., age 28. Operated on January 24, 1905, for a perforated appendix, with free pus in the general peritoneal cavity. The appendix was removed at this time and to the ilet of the cavity thoroughly performed. Six days later an accumulation of pus was drained from the left hypochondriac region under the spleen and another from down in the pelvis. After the second operation there was the most enormous abdominal distention I have ever seen. The use of the rectal tube, of all kinds of enemata, including the alum enema of Harding, and the most potent cathartics were utterly ineffectual. There was evidently present a dynamic ileus, resulting from an over-distention and a consequent paralysis of the intestine. There was a loop of gut accessible through the drainage opening, so I selected the most convenient place for the establishment of a fecal fistula and inserted the smallest size trocar and cannula.

The escape of gas was enormous, and there was a proportionate

relief experienced by the patient. Shortly after this procedure, the bowels began moving naturally, and flatus was expelled per rectum. On the following day, however, the meteorism had reaccumulated to such an extent as to cause the patient serious inconvenience, and in compliance with her urgent request, I again tapped the gut with the same result. This was done on three successive days, after which there was no further trouble. This patient returned home from the hospital and was up and around in a wheel chair, when she contracted pneumonia in the ninth week after operation, and died a few days later.

The interesting features of this case are, first, the existence of a dynamic ilius caused by an overdistention, which in turn resulted from a rather extensive involvement of the peritoneum. And second, the fact that the tapping of the gut on three successive days not only relieved the urgent symptoms, but was not followed by the slightest leakage.

Case V.—Infant, age 8 months. Had been apparently well until one o'clock A.M., May 5, 1905, when it awakened crying, and after nursing, vomited. It continued to show evidences of violent paroxysmal pains, so the mother administered a free dose of castor oil. The crying and restlessness continued until I saw the baby about eight o'clock. I was told that the bowels had acted several times; evidently from the oil, as the mother said it could be distinctly observed in the movements. The temperature was 99, pulse 120, abdomen slightly tympanitic and soft. Child looked ill. The colon was ordered flushed with normal solt solution and 1-10 grain doses of calomel with soda was prescribed every half hour. Later on in the day there were frequent movements consisting of blood and mucus, accompanied with a considerable amount of rectal tenesmus.

At six o'clock in the afternoon, when seen again, the temperature was 104, pulse 140, vomiting had been practically continuous all day, bowel movement was frequent and consisted of blood and mucus, and while a satisfactory examination was impossible on account of contraction of the abdominal muscles, still I thought I could make out a mass in the left lumbar and left iliac regions. Rectal examination was negative. A diagnosis of intussusception was made and an operation performed an hour later. There was found to be an invagination of the cecum into the ascending colon, and in turn the ascending colon into the transverse colon and the transverse colon into itself, so that the cecum lay in the upper part of the sigmoid flexure.

Moderate traction on the ileum was ineffectual in reducing

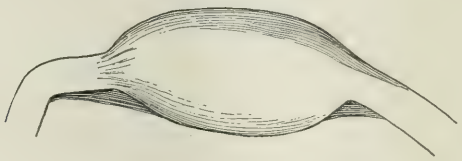
the intussusception, but by a milking movement upward of the upper sigmoid and descending colon it was reduced without difficulty. A part of the cecum and the adjacent portion of the ileum were rather blue, but the circulation returned fairly satisfactorily after a few minutes, so they were dropped back and the incision closed. After the operation gas was passed freely per rectum, but the temperature remained high, and the child died eighteen hours after operation, with a temperature of 106. At post mortem there was found to be no peritonitis and the intestinal canal was patent throughout. So death in this case was evidently due to an infection within the alimentary canal. Had operation been done earlier I think it possible that this patient's life might have been saved.

CASE VI.—J. A., age 7. In August, 1904, I operated on this child for an acute appendicitis. The appendix contained pus and was surrounded by rather firm adhesions. These were broken up and the organ removed without rupture. The incision was closed in layers, and recovery was prompt and complete. At the time of this operation there were noticed a number of enlarged mesenteric glands. On the night of June 22, 1905, after having eaten rather inordinately of ice cream, this child was taken suddenly with severe abdominal pain and nausea and vomiting. The mother gave three grains of calomel in one-grain doses, and followed next morning with a soapsuds enema, which was effectual. The nausea, vomiting, and paroxysms of abdominal pains, however, continued. I saw the child at ten o'clock on the morning of the 24th, in consultation. The pulse was 100, temperature 99. Abdomen very slightly distended and not particularly sensitive. The bowels had only acted once since the administration of the calomel, and that was in response to the enema. The child's expression was good and he did not appear very sick. The vomiting was at considerable intervals, and would usually occur after taking water.

While the symptoms at this time were rather indicative of an obstruction, still the condition of the child was so good that I decided to wait. When seen at five o'clock that afternoon the diagnosis was positive. Nausea and vomiting had continuen all day and the vomitus had become stercoraceous. Abdomed much distended and pain intense. Operation was performed three hours later; this time being consumed in moving the child a distance of eight miles to my private hospital. A loop of the lower ileum, eighteen inches in length was found strangulated by a strong band of adhesions, against the right side of the

vertebral column. Whether these adhesions resulted from the inflamed mesenteric glands, which were still present and about the same size as when the appendectomy was done eleven months before, or whether they were the result of an old inflammation around the appendix, I do not know. The strangulated loop was enormously distended and very much discolored.

After severing the adhesive band, the distention was immediately relieved and the circulation gradually returned. While waiting for the re-establishment of the circulation, it was noticed that at a point corresponding to about the middle of the strangulated loop there was a circumscribed spot opposite to the mesenteric attachment about the size of a silver quarter, which was a deep blue, and which made a marked contrast to the bright red of the remainder of the gut, through which the blood was beginning to course. I thought at first that this was a localized area of necrosis, but soon observed that it was increasing in size and that it was an intramural hemorrhage. After watching it for

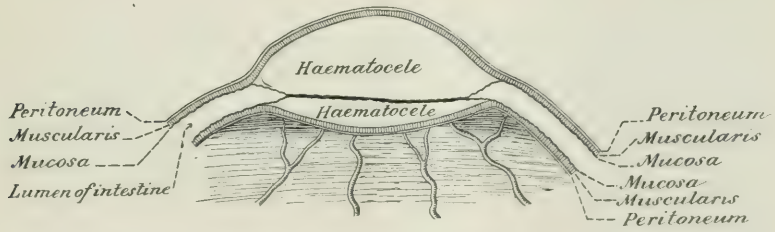


a few minutes, the discoloration almost completely surrounded the gut for a distance of about two inches, but as it did not interfere with its patency as proven by the fact that the finger could be invaginated without difficulty, and as it showed no advance, it was dropped back and the incision closed.

The convalescence was rapid and uneventful, and on the seventh day after operation the condition was so perfectly satisfactory that I consented to the patient being carried home on the street car in his father's arms. A half hour after reaching home the boy began to vomit, and complained of a severe abdominal pain. He had been eating rather liberally, and my first thought was that he was suffering with an acute indigestion. However, when he got back to the hospital, his condition was exceedingly suggestive of ileus. The abdomen had become somewhat distended and was generally sensitive. The temperature was 97, the pulse 110. He was vomiting a greenish material at frequent intervals. Enemeta were given, and at first were returned colored by fecal matter, but later were absolutely ineffectual.

He was watched for a few hours, during which time all of the symptoms became aggravated, and the vomitus assumed a fecal odor. The abdomen was opened again through the incision made a week before and this condition was found: at the point at which the intramural hemorrhage had been observed the intestine presented a spindle-shaped enlargement about five inches in length, at its center about three times the normal circumference. It was a bluish-black color, and throughout the entire extent of the enlargement the lumen of the gut was entirely obliterated. The intestine above the enlargement was distended, below it was collapsed, and no gas could be forced through. It was evident that there was present an intramural hematocele of either the submucus or the subperitoneal type which had dissected up the layers of the intestinal wall, and by encroaching on the lumen had caused its complete obliteration.

The hematocele was quite tense, indicating a considerable degree of pressure, and the peritoneum covering it was rather lusterless, so a resection was decided on. Nine inches of gut



were resected, and an anastomosis accomplished by means of a Murphy button. The button was passed on the sixth day and the child was up in two weeks. An effort to forcibly invaginate the finger into the lumen of the resected specimen ruptured the hematocele externally through the peritoneal covering at about its center, and opposite to the mesenteric attachment. The hemorrhage was found to be of the submucus type, and evidently the pressure of the hematocele had caused a weakening in the intestinal wall at a point farthest from the entrance of the bloody supply.

CONCLUSIONS.

I believe that if all cases of intestinal obstruction could be given the benefit of operation within the first twenty-four hours, the mortality in this condition would be completely revolu-

tionized. The fact that some cases do exist for days and are relieved by operation leads us in cases in which there is an element of doubt, sometimes to delay surgical intervention until the chances for recovery are materially lessened. Occasionally a positive differential diagnosis is exceedingly difficult, but the conditions from which a differentiation cannot be positively made are almost invariably equally as imperative in their demands for surgical intervention as would be the existence of an ileus. Among the most common of these conditions may be mentioned appendicitis, gallstones, infected gall bladder, floating kidney with a twisted ureter, perforated gastric ulcer, ruptured extrauterine pregnancy and salpingitis, all of which when giving rise to symptoms that could lead to confusion in the diagnosis of ileus would positively indicate operation. The bare possibility of a mistake in diagnosis in conditions in which no intraperitoneal operation is indicated (such as a calculus passing through the ureter), should not act as too serious a restraint, for such a mistake would of necessity be most rare, and an abdominal section in such a condition could do no possible harm.

Sudden severe abdominal pain should always suggest the possibility of intestinal obstruction, unless clearly due to some other cause. When associated with nausea and vomiting, and when it does not respond to moderate doses of morphia, hypodermically, the condition is still more suggestive. And permit me to say by parenthesis that the frequent administration of large doses of morphia in cases where a possibility of ileus exists cannot be too severely condemned, as it simply masks symptoms and only too frequently leads to unnecessary and dangerous delay. Sudden severe abdominal pain, associated with nausea and vomiting plus obstipation which does not respond within a few hours to potent cathartics and stimulating enemata, constitute a condition in which the indications for operation are positive. The inability to isolate a distended loop of intestine, the presence of shock and stercoraceous vomit go to confirm the diagnosis, but should not by their absence cause undue delay in operating.

As a general proposition, the more sudden and violent the storm of symptoms initiating the conditions, the more imperative the indications for early operation.

In conclusion I wish to reiterate that after the diagnosis of ileus has been made, the adoption of treatment other than surgical with the hope that it may effect a cure, is utterly unjus-

tifiable, and that procrastination, based on the hope of a spontaneous recovery, is in my opinion pretty nearly criminal.

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DISCUSSION.

Dr. Robert T. Morris agreed with the essayist that on account of the difficulty in making an accurate diagnosis of intestinal obstruction too much time was often lost and the case allowed to progress to a dangerous stage. Within the past forty-eight hours he had operated on two cases of intestinal obstruction. In one case there was a delay of six days, and in the other ten days, in order to make an accurate diagnosis, although a diagnosis of intestinal obstruction had been made some time previously. Within forty-eight hours later he operated upon both cases; he had made a diagnosis of gangrenous appendicitis with adhesion of the bowel. The appendix was found in the pelvis in both cases. No doubt there was difficulty in making the diagnosis on the part of the physicians who had seen these cases, but the cardinal symptoms pointing toward intestinal obstruction should have been sufficient to call for an immediate operation, no matter what the other concrete points in the diagnosis may have been. He favored opening the abdomen at the point of greatest pain, but not necessarily. One might have to make a long incision in order to get at the real point of obstruction, and pain might be reflected to so many points from various sympathetic centers that it was extremely difficult to localize the point of obstruction from the point of greatest pain. Neither of the patients upon whom he operated yesterday had any point of greatest pain.

The speaker's practice of late years was to make a number of short incisions in tracing the obscure point of intestinal obstruction rather than do a severe, extensive, wide open operation, which gave a clear view of everything, even including the patient's soul.

Surgeon-General Suzuki, of the Imperial Japanese Navy, was asked to participate in the discussion. He related a case of intestinal obstruction. Just before the Russo-Japanese war, two years ago, a seaman from one of the battleships was sent to a neighboring hospital, and at first he thought his case was one of appendicitis, inasmuch as the pain was located in the region of the appendix. He had a temperature of 38° to 39° C. There was some distention of the abdomen. A blood count was made, and all other diagnostic aids made use of to make the diagnosis sure. Finally, a laparotomy was decided upon and performed. The abdomen was opened near the appendix and loops of intestine were found strangulated in three places. There was one long loop around the curve of the large intestine, and the small intestine was adherent to it. These bands were cut and the obstruction removed. A careful examination did

not disclose any inflammation of the appendix, nor of the cecum, but just behind the peritoneum, in the wall, there was an accumulation of pus which was removed, the abdomen closed, and patient recovered.

Dr. Henry Howitt did not coincide with Dr. Robert T. Morris in regard to making short incisions. He thought in the majority of cases, in the acute stage of intestinal obstruction, it was better to make a large incision and eviscerate, so as to find the obstruction more readily than one could hope to do through a small incision. The intestine should be covered with moist sterilized gauze, kept at a proper temperature by irrigation. By this means he had been enabled to save the lives of five patients with intussusception. He believed all of them would have died had small incisions been made, with a view to locating the seat of obstruction.

Dr. John Young Brown stated that Dr. Robert Morris had forcibly emphasized the dangers of doing too much, but he thought in many of these cases we could do too little. He recalled one case in particular that emphasized this point. The patient was a child in whom an intramural hematoma was found and subsequent resection was necessary. He believed that in all cases of intestinal obstruction in which there was a strangulated loop of bowel, as well as in all cases of strangulated hernia, if there was the slightest doubt about the integrity of the gut, it should be resected. The literature was literally full of cases where taxis had been done, and the supposed hernia had been reduced, but the patients had afterwards died from intestinal obstruction. There were many cases similar to the one reported by the essayist where necrotic spots were found on the bowel, and the gut was returned with some degree of temerity, disaster following. The speaker made it a uniform practice, whenever there was any question relative to the integrity of the bowel, to do the work thoroughly at once. He agreed fully with Dr. Morris that just as little as possible should be done consistent with thorough work.

Dr. Morris, in closing the discussion, again emphasized the importance of making an early diagnosis, and in those cases in which an early diagnosis could not be made he believed the surgeon ought to operate anyhow. Where a differential diagnosis could not be made, where there was doubt as to whether the symptoms were due to the appendix, to the gall-bladder, etc., with the presence of such symptoms the indications were positive to operate. If operation was resorted to early, he thought the mortality rate would be very materially reduced.

DIAGNOSIS.

BY
JOHN B. DEAVER, M.D.,
Philadelphia, Pa.

"He who would cure well must diagnose well."

That the correct diagnosis of a surgical disease is a matter of paramount importance, is readily admitted by nearly every one; but while it is thus theoretically acknowledged, there are, I regret to say, only too many surgeons who do not put into practice their theories—who do not practise what they preach. It is, of course, unnecessary for me to say that I have not the presumption to attempt to teach the accomplished surgeons of this society the principles of diagnosis; but what I had in mind to put before you this evening is the tendency, which it seems to me exists at present, of making our diagnoses (or of not making them) by means of a consultation of specialists—hematologists, bacteriologists, skiagraphers, and microscopists—or relying more upon the findings of these specialists instead of by a minute, painstaking and complete physical examination, together with a careful study of the clinical history of the patient. Too much stress cannot be laid upon the latter.

Pathognomonic symptoms are one by one disappearing before the advance of medical and surgical science, but some of our pathologists and bacteriologists are still ready to give us their diagnoses based solely upon their special findings, with the utmost disregard of the physical examination and of the natural history of the disease in question. There are, to be sure, some honest pathologists who are unwilling to diagnosticate a sarcoma merely from a study of the suspicious tissue under the microscope. Indeed, it is my impression that the more experienced the pathologist becomes the less able will he be to declare with unerring certitude that a certain aggregation of round cells, atypically arranged, is a sarcomatous neoplasm, and not merely a mass of granulation tissue. A conscientious pathologist, such as I describe, will merely report his histological findings and will leave it to the surgeon to confirm or dis-

*Read at the Eighteenth Annual Meeting of the American Association of Obstetricians and Gynecologists, at New York, September 19-21, 1905.

prove the suspicion of malignancy by reference to the clinical side of the disease.

Diagnosis by Exclusion.—It is manifestly impossible to exclude all but one organ or portion of the body, and therefore a diagnosis by exclusion is an illogical and unscientific method of making a diagnosis. It should always be the last resort. Diagnosis by inclusion, as it is called, in which the organ producing symptoms is first considered, and all other parts of the body which may bear a pathological relation to it are subsequently examined, is a much more rational procedure. And although, as we all know, the primary seat of disease is not always the same as that which produces symptoms, yet in ninety-nine cases out of a hundred it is the primary seat of disease that requires treatment. Familiar examples of this fact are found in cardiac lesions producing gastric symptoms, or dropsy; eyestrain or uterine displacements producing headache; and infected wounds of the hands or feet producing lymphangitis. So that this method is much more apt to lead us to the detection of the diseased organ than is that of diagnosis by exclusion.

Yet this tendency to base a diagnosis solely, or almost entirely on laboratory findings, is widespread and becomes constantly more prevalent. But the various portions of the human frame are not so dissociated that they can be discussed as separate entities in diagnosis any more than in treatment. Looking for a disease in the body of a patient is not like looking for a sick cat in a room full of felines. In the latter case it will not be difficult to detect the diseased animal by examining and putting to one side all who are healthy; but when the human being becomes ill he is more or less deranged in every part of his anatomy, and it is the patient, not the disease, that we must treat.

The reason that this fondness for laboratory diagnosis is so widespread, is, I think, because the students of medicine are taught laboratory methods to an undue extent. The constant cry in all medical colleges at the present day is for funds to build and equip laboratories. The students are forced to spend hours at a time in the laboratories studying the products of diseases or the causes of disease. while the time formerly allotted to the study of the disease itself is reduced to a minimum or is altogether expunged from the roster. Instead of drilling into the minds of the students the eternal principles of surgery, the faculty sends them into the laboratory to the end that they may be-

come adepts in the art of blood counting, or may be rendered capable of distinguishing between consanguineous tribes of microorganisms. This is a fatal mistake. The students will become perfectly familiar with the microscopical appearances of the anthrax bacilli, of the tubercle bacilli, will readily distinguish the colony of the streptococcus pyogenes from that of the staphylococcus albus or the colon bacillus; but they will not know a case of anthrax when they see it, they will not be able to distinguish between a phthisical lung and an acute bronchitis, they will not know an abscess from an aneurysm, a sarcoma from a gumma, nor a case of erythema nodosum from simple bruises on the shins.

These methods of study and diagnosis cannot be carried by the student away with him to his country home; they cannot be conveyed from one patient's house to another; they are never available in emergencies. And while I earnestly advocate that every young physician returning to his country town should take a good microscope with him, and should examine his patient's blood and urine on every suitable occasion, yet I am thoroughly convinced of the fact that laboratory diagnosis, as it is called, requires now and ever will require, a well-equipped laboratory to render it of any service whatever; and until every physician can possess his own laboratory, or can have a position on the staff of a hospital so equipped, it is worse than useless, it is a criminal waste of their time, and a menace to their future patients, to endow students with no skill but in such mechanical methods.

Practical instruction in such matters should be postponed for post-graduate courses, or for the period which every well-intentioned graduate spends as hospital resident. Four years are all too short a time in which to learn the principles of medicine and surgery, with a thorough grounding in anatomy, chemistry and physiology, those foundation stones of medical science. If the principles on which rest the mechanism of blood counting and bacteriology are sufficiently explained, it is no difficult matter to acquire at a later period sufficient manual and ocular dexterity to use with precision the instruments required. Teachers of anatomy have long since ceased to demand artistic dissections as the routine work of the student. They know that skill in dissection can only be acquired by practice, and they are at present bending their energies towards the practical applications of anatomy to medicine and surgery, and aim rather to show to the students dissections which explain them-

selves and which will impress certain principles upon their minds. The bacteriologists, the hematologists, and the pathologists should follow their example, and while they show the finished product to the student and explain to him in detail the principles involved, they should not insist upon his repeatedly making with his own hands complicated or elaborate tests or preparations.

Giving Pathology.—A young physician who is a past master in the art of making the Widal test for typhoid fever, but who does not know at what period of the disease it first becomes available for diagnosis, nor that it may remain positive for many years after recovery from typhoid fever, may be a valuable adjunct to the test tubes and Bunsen burners of the laboratory, but will be wofully useless as a medical attendant throughout the disease. One who depends on the skiagraph for the diagnosis of a fracture may very well treat a patient for a Colles' fracture which had healed without deformity years before, while neglecting an overlying tenosynovitis of very recent origin. One who examines the stomach contents with all proper assiduity may, by neglect of proper physical examination, allow his patient to die of spreading peritonitis before discovering that the intestinal tract was perforated. All these, no doubt, are extreme examples, but will serve to elucidate my meaning.

It is thus that the introduction of instruments of precision has done real harm to the medical profession, and has lulled the brains of surgeons to indolent repose, while calling upon their fingers to renewed exertions. Not only does it do harm to the patients, as I have already pointed out, but it tends to lessen the dignity of the surgical profession itself. It is not so very long ago that the barber-surgeon stood by as the learned and lordly physician ordered him to bleed the patient for a malady of which he knew nothing, and to produce a result about which he cared less. The surgeon of the present day who is willing to take his diagnoses ready made; who operates for appendicitis because there are 20,000 white blood cells to the cubic millimeter; who does a gastroenterostomy because the pathologist reports absence of free hydrochloric acid in the stomach; who explores the brain for a tumor because someone saw a choked disc or who removes a man's tongue because the laboratory report said carcinoma, but who afterward learns that the patient had other lesions of tertiary syphilis on his body—such a surgeon, gentlemen, is on a much lower plane than the barber-surgeon of yore, because this last had no glorious

heritage of surgery to look back upon, and was actually himself a step in the evolution of the art of modern surgery.

Diagnosticians.—It does not seem to me that we have at the present day diagnosticians who can vie in diagnostic acumen with the masters of the past. Those who were within my own particular knowledge—Agnew and Ashhurst—rarely if ever erred in the diagnosis of an obscure case, and so convincing were their reasons for the diagnosis that none was so bold as to dispute it. These men and their contemporaries were brought up when microscopes were little used, before blood counts and bacteriology were heard of, and when *x*-rays were an undreamt dream. They had learned the principles of diagnosis as students, and they had studied the course typically pursued by every disease then known to surgical science. As a consequence, when questions of diagnosis arose they could reason from principle to principle, and they could class the disease from the history the patient narrated. They knew what symptoms and signs to look for, what questions to ask, and could anticipate the course the disease had pursued. One of these surgeons having presented to him a patient with a large tumor in the popliteal space, and being told by the patient that another surgeon had pronounced it a sarcoma and had counseled immediate amputation of the hip, could unhesitatingly affirm, as soon as he laid his hand on the growth, that it was a myxoma, and that it could safely be removed by dissection. This surgeon knew the extreme rarity of sarcoma in this situation; his practised touch could tell the difference in feel; and he was confirmed by the history of the case previous to the operation as well as by the successful result of the operation itself. Now the *x*-ray must be used before a diagnosis of osteosarcoma is made. The surgeon who must depend upon the *x*-ray to differentiate between osteosarcoma and osteitis limits his usefulness.

Surgeons such as these would not undertake an operation merely to make sure of a diagnosis. In obscure or doubtful cases they pondered well all the symptoms, studied their text books and their case records, returned again and again to the charge, and did not feel that they merited the title of surgeon until they could rest assured that they had discovered what affection it was which they were trying to treat, and could offer their patients a reasonably certain prognosis.

The so-called "snap diagnosis" was never made by such surgeons. They could arrive at their conclusions quickly if need be, and recollected the surgical maxim that it is better to do the

second best thing for your patient rather than to let him die while a decision is being reached; but even then they did not jump at their conclusions. They argued from well-grounded premises and reached a logical conclusion. They were not like that surgical assistant of whom Pogge tells the following story. Being taken around to the houses of various patients by his preceptor this young man was struck by the unerring exactitude with which his master discovered the cause of the disease in certain errors of diet. On inquiry he was told by his teacher that it was a very simple matter to know that a man with a bellyache had overeaten himself with dates when the surgeon could see the date stones on the table in the patient's room; or that another's indigestion was due to overindulgence in oysters, when the shells were on the floor beneath the bed. One day, in his preceptor's absence, this assistant was called to the house of a man who had been taken suddenly ill. The young man looked around the room in vain for any remains of food, and was at a loss what to tell the patient ailed him, till beneath the bed he chanced to spy a saddle and bridle; whereupon he taxed the sick man with having devoured a horse, and was promptly kicked out for his stupidity.

Careful surgeons avoid undue haste in diagnosis. They know what fatal errors even the most brilliant surgeons have committed through haste. Every student of surgery should be told the lamentable tale of the well-known Irish surgeon Deas, who, mistaking a femoral aneurysm for a psoas abscess, plunged his bistoury into it, and saw his patient bleed to death before his eyes after two or three powerful spurts of the life stream. And they should remember the melancholy conclusion of this tale, how the heartbroken surgeon, recognizing that the mistake was one of pure carelessness, went his accustomed rounds in the wards with even more than his usual *sangfroid*, but returned to his consulting room that night insane with sorrow, and as he pondered over the tragedy of the day, drew forth his bistoury again and with the calm deliberation of despair opened his own femoral artery and allowed himself to follow his unhappy patient to the grave.

Diagnosis by means of the therapeutic test is another fallacy of the present day; and while I am heartily in favor of delaying operation in certain cases of suspected malignancy until the effect of antisyphilitic remedies have been tried, I nevertheless, think that in some respects the method of diagnosis by the therapeutic test is surgery run mad. Not only do surgeons

dose their patients with potash, without taking the trouble to inquire into their past history and without searching the body and examining the bones and internal organs for other manifestations of syphilis, but in various other diseases they perform operations which are nothing more or less than therapeutic tests to make the diagnosis clear. I refer now to exploratory operations in general. To begin with a familiar example, how many surgeons will remove the appendix in cases of vague abdominal pain and discomfort without even the semblance of an attempt to make an accurate diagnosis? If the patient is relieved of his symptoms, the diagnosis of chronic appendicitis is confirmed. If such a result is not obtained, the surgeon is forced to acknowledge that the appendix was not the cause of the symptoms. What else than a therapeutic test in such operating as that? What wonder that modern operative surgery is scoffed at by the layman, when it is so ruthlessly wounded in the house of its friends? How can we operators who are now growing gray in the service of surgery best teach our young surgeons the precious privilege of conscientious operating? Is it not by relegating the exploratory incision to the autopsy table where it belongs, instead of giving it the place of honor at the antemortem operating table? Is it not by cultivating our powers of diagnosis, and by not resting satisfied with our abilities as surgeons until we can tell with a reasonable degree of certainty whether an operation will benefit the patient? In other words, gentlemen, we must not perform an operation merely to ascertain whether an operation is required; we must not resort to the therapeutic test of an exploratory operation.

I well know that there are certain so-called exploratory operations which I myself perform not unfrequently, in company with other surgeons who aim to be conscientious operators. These operations are mainly abdominal explorations whose aim is to determine whether a malignant growth can be removed, or whether the remaining days of the patient can be rendered more comfortable by some manner of intestinal anastomosis. The term exploratory cannot be used of these operations in a reproachful sense. We know that our patient has a tumor, and that it should be removed. Its exact size and the extent of its adhesions to neighboring structures cannot be determined without opening the abdomen; and very exceptional are the cases where nothing can be done to better the patient's condition after the abdomen has been opened. These operations are not like those for brain tumor, where the diagnosis rests

practically without exception on symptoms alone, there being no physical signs to guide the surgeon in reaching his conclusions with the result that an exploratory operation is first done, in which the skull is opened, and subsequently, when ten days or more have elapsed, if the patient has survived the first intervention, his life is again jeopardized to the end that the surgeon may conduct a physical examination through the opened skull—the result not infrequently being that no tumor at all is found, or if one is found, that it is inoperable, or if operable and removed that the last state of that patient is worse than the first.

One of the most legitimate fields for exploratory operations, in my opinion, is in cases of abdominal injury, to check hemorrhage, or to close rupture of the hollow viscera—these are imperative indications for abdominal section, and in the very nature of the case the undertaking is largely exploratory. The same may be said of the case of a patient suffering from typhoid perforation, or from other acute abdominal inflamations, as those of the appendix and those due to gastric, duodenal, or gall-bladder perforations. In these cases the symptoms of peritonitis sometimes so overshadow the picture that it is not always possible to decide before operation which is the special region affected; but the indications for incision to repair the damage, are sure, and hesitancy or uncertainty on the surgeon's part may mean death to the patient. But no surgeon should have to open the abdomen merely to learn if the patient has chronic appendicitis or gallstones, to discover whether there be pyloric obstruction, or to decide if the patient be or be not pregnant. Such chronic affections as these are the proper field for refinements in diagnosis, and offer the greatest opportunity for the aids which the laboratory affords. While decrying with all the power that is in me the modern tendency to make our diagnoses in the laboratory, I have yet on too many occasions received valuable suggestions from the pathologist's findings to be unaware of what value the laboratory may be when in its proper place, and when the information it furnishes is properly correlated with the clinical picture presented by the patient.

My endeavor then, in this short paper, has been, in the first instance, to attempt to place the matter of laboratory diagnosis in its proper light, showing that it is after all only one form of diagnosis by pathognomonic symptoms. I have tried also to make a plea for the more thorough education of medical students in the principles of physical diagnosis, and in the knowledge of

the natural history of surgical diseases, while at the same time advocating a postponement of laboratory methods until the former have been completely mastered. I have endeavored to show the real danger which, as it seems to me, exists, of the modern surgeon degenerating into a mere mechanical appliance, subject to the controlling mind and will of the laboratory diagnostician. Yet, while above all things discountenancing haste and carelessness in reaching conclusions, and the judicious resort to the therapeutic test of exploratory operations, I have pointed out what seem to me the legitimate fields of the exploratory incision.

1634 Walnut Street.

DISCUSSION.

Dr. J. Henry Carstens took issue with the essayist in belittling the efforts of men engaged in other departments of medicine. He could not agree with Dr. Deaver that a blood count was not a good thing, as it was in his opinion. There were cases upon which he would not operate or dare do so without a blood examination. With a blood examination he could tell better what the prognosis would be; he could handle the patient better, and know what to do. He thought he could operate with greater safety, and be more judicious in his selection of anesthetics and the method of operating if he knew about the urinalysis of this or that patient. He thought surgeons ought to be grateful to men engaged in other lines of work as they were of great assistance to them. Surgeons should help these men, and they should all work together.

Dr Deaver, in closing the discussion, said that he did not make the statement that a blood count was of no use, but stated that students in these days were taught how to make blood examinations and to analyze stomach contents to the exclusion of practical teaching in surgery and of the underlying principles of surgery. If Dr. Carstens or any surgeon depended upon a blood count, he thought his usefulness was limited. He meant this.

While the speaker had considerable respect for the use of the *x*-ray, yet in a number of cases it was no use to him whatever.

Dr. Samuel W. Bandler reported a case of anuria for thirty hours following double salpingo-oophorectomy, relieved by a secondary laparotomy.

CESAREAN SECTION; REPORT OF AN UNUSUAL CASE.*

BY
HENRY SCHWARZ, M.D.,
St. Louis, Mo.

THE conditions which call for the classical Cesarean section as the operation of choice over the Porro operation, or over symphyseotomy, are, as a rule, so well defined and the results in properly selected cases and in suitable surroundings are so uniformly good, that it would hardly be justifiable to bring the report of a case before this society, unless such case presents some unusual features, and on this account I hope that the following report may prove acceptable to you.

At 8 A. M., November 10, 1903, I was called by Dr. Standinger of St. Louis, to see a Mrs. R., who lived with her husband's family in two rooms and a kitchen on the second floor of a tenement house. The woman was fifteen years old and a mere child in body and appearance. Labor pains had set in at term on November 7, and the doctor had been in the house sixty hours—namely, from Saturday evening until Tuesday morning. The bag of waters had ruptured Sunday morning; the uterine contractions had been powerful and rather frequent until early Tuesday morning, when they became weak and infrequent, and the patient showed marked signs of exhaustion. The fetal heart beat was strong and regular, about 150 per minute, and could be heard on the right side of the mother's abdomen, below the navel. Vaginal examination showed the cervix retracted over the fetal head; only a small section of the latter had entered the pelvis; the small fontanelle pointed straight to the right, while the sagittal suture ran transversely, and the right parietal bone was pushed under the left one. There was considerable caput, which made the fetal head appear to better engaged in the pelvis than it in reality was. The doctor had twice introduced the forceps, but he was unable to deliver, and he abstained from making forcible traction. The patient's temperature was normal. The doctor, a former country practitioner, had evidently been aseptic during the long sixty hours of his attendance, in spite of the unfavorable surroundings. He carried a good sized copper tank, which he used

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as a sterilizer or as a bathtub for babies, according to the exigencies of his cases, and he was lavish in the use of bichloride towels on and under the body of his patient.

The woman was now removed to the Washington University Lying-in Hospital; she was given strychnine and some nourishment, and after a few hours' rest she was brought into the operating room at 2 P. M., when the question of how to deliver had to be answered. The pelvic measurements had shown a pelvis too small in all directions. Distance between spines, 21 cm.; distance between crests, 24 cm.; distance between trochanters, 26 cm., and the external conjugate, 18 cm.

Spontaneous delivery, or at any rate delivery through the natural passages, is by no means incompatible with these measurements, but it must be remembered that an accurate knowledge of the dimensions of the maternal pelvis will not enable us, in a given case, to say whether or not the passage of the fetal head through that pelvis will be possible, because, in the first place, we have no means of accurately measuring the dimensions of the fetal head in utero; and because, in the second place, the knowledge of these dimensions would not enable us to answer the question in all cases, because we cannot know how far the fetal head will mold and adapt itself to the given space.

Most of us have seen cases of highly contracted pelvis in which delivery was easily accomplished, because the head, by considerable overlapping of bones and by molding, fully adapted itself to conditions, while at other times we have found heads that would neither mold nor overlap to a reasonable degree; such cause trouble in spite of average measurements of fetal head and maternal pelvis. It is for these reasons, that the history of previous labors in multiparous women, with moderate contraction of the pelvis, is of such vital importance to the obstetrician in determining his course of action.

In women who are in labor for the first time, we lack this valuable guide, and our duty to the patient demands that we give resourceful nature a fair chance. This we do, when we keep infection away from our patient, when we regulate the labor pains, and keep rectum and bladder empty, and when we husband the woman's strength from the very beginning, thereby enabling her to hold out for two or three days, and in many instances to escape a formidable operation, by a timely molding and descension of the fetal head.

In our case sixty hours of labor had demonstrated that there

was a mechanical disproportion between the maternal pelvis and the fetal head, and for twenty-four hours labor had been at a standstill.

Craniotomy was out of the question, because the fetus was alive, and the patient in surroundings which permitted of any major operation. Moreover, even if there had been reasonable assurance of the death of the fetus, the unyielding tender vagina and vulva of the child-wife would have made craniotomy a risky procedure. For the same reason symphyseotomy could not be seriously thought of in our case, while in a multiparous woman under similar circumstances it might have been a reasonable mode of delivery.

The question, therefore, narrowed down to a choice between the classical Cesarean section and the Porro operation. Generally speaking, we are in the habit of resorting to the classical operation in all clean cases, while we reserve the Porro operation for the infected cases, and those complicated with certain forms of uterine neoplasms.

Could we consider our case a clean one? The membranes had ruptured forty-eight hours ago; the patient had been in unsanitary surroundings; repeated attempts at instrumental delivery had been made and meconium had discolored the amniotic fluid.

Usually such a case is infected, but considering that our patient showed normal temperature at eight o'clock in the morning, that her temperature was still normal at two o'clock in the afternoon, after she had rested and was prepared for operation, and in view of the exceptional care displayed by her attending physician during his sixty hours' attendance, I determined upon the classical operation and that the more readily because on the operating table the fetal heart-beat was found to be about 100, and there was additional escape of meconium. The chances of securing a viable fetus seemed doubtful, and the tender age of our patient made the mutilating and sterilizing operation of Porro especially appalling.

The abdomen was opened in the usual way; the uterus was rolled forward and the intestines, were protected by a liberal gauze-packing; an elastic ligature was placed loosely around the neck of the uterus, while the broad ligaments were compressed by an assistant; the womb was opened by a long incision in the median line, reaching down to the membranes; the placenta was found in front and to the left; placenta and membranes were detached and the latter were ruptured over the left

knee of the fetus, which was seized, and the child was quickly extracted; the cord was cut between two artery clamps; the child passed over to another assistant, and placenta and membranes were removed. Placenta, membranes and umbilical cord all showed the characteristic yellowish-green discoloration due to the escape of meconium and its mixing with the amniotic fluid. There was very little hemorrhage; the uterine cavity was wiped dry with gauze-sponges and the uterine wound was closed by six or seven sutures of Van Horn's twenty-day chromicized catgut, which were placed one centimeter apart and which did not include the decidua nor the peritoneum; the latter was closed by a running suture of plain catgut and the abdominal wound was closed by three running sutures, consisting of plain catgut for the peritoneum; twenty-day chromicized catgut for the fascia and ten-day chromicized catgut for the skin.

The patient was put to bed at 2:30 P. M., her temperature was then 98.6; at 7 P. M. it was 100°; at 10 P. M., 103.4, and at midnight 105°, while the pulse was 140 and the respirations 30. By 9 A. M., November 11, the temperature had declined to 100, at which height it remained with slight variations for two days, when it became normal. The patient nursed her baby, and made an uneventful recovery.

The baby, a boy, weighed 7½ pounds, and showed average proportions. The shape of the head corresponded to the findings of the vaginal exploration during labor. The scalp showed two pressure marks of a yellowish-green appearance, oval in shape, and about two centimeters in the long diameter; one was situated over the upper anterior corner of the right parietal bone, while the other was found farther back and lower down over the left parietal bone.

The child was deeply asphyxiated. After the air passages were freed from the aspirated foreign substances, it took over one hour of artificial respiration before the child drew its first breath. Contrary to expectation it improved from day to day; a line of demarcation formed around the pressure marks; the dead tissue dropped out on the fifth and sixth day respectively, and the wounds healed by granulation.

Most cases of deep asphyxia with aspiration of meconium and other foreign substances, and requiring artificial respiration for an hour or more, which have come under my observation have been taken on the third or fourth day, with a fatal foreign body pneumonia.

440 Newstead Avenue.

DISCUSSION.

Dr. Albert Vander Veer, of Albany, New York, stated that with a gravid uterus, with delivery affected in the manner the essayist had described, he preferred to make an incision across the fundus, doing away with any ligatures or compressing the broad ligaments in any way, just cutting across the fundus of the uterus from one corner to the other. By this means hemorrhage was comparatively slight; the fetus could be delivered quickly, the placenta delivered immediately, contraction of the uterus would take place, so that hemorrhage would be very slight, then putting in ligatures. The operation was short. Time was an element that ought to be considered in doing a classical Cesarean section.

Dr. Miles F. Porter reported a case in which he resorted to Cesarean section. The woman was a multipara; she had given birth to three of four children prior to this time. The woman had a large tumor situated below in the pelvis, under and behind the uterus. She had just begun to go into labor; she was brought to the hospital; the abdomen was opened, and an ovarian tumor was removed, separating a good many adhesions. The question arose whether the woman should be permitted to go on to term or be delivered, or could she be delivered with less trauma and less risk through the open abdomen. He finally decided to deliver the child through the abdominal opening, which he did. He paid no attention to the insertion of the placenta. He made his incision over the anterior aspect of the uterus, introduced his hand to get hold of the child, and delivery was effected inside of a minute from the time the incision was made. There was very little blood lost. Both mother and child recovered.

Dr. Roland E. Skeel, of Cleveland, Ohio, thought the point made by Dr. Vander Veer regarding the use of the rubber ligature was correct. He had delivered three women by means of Cesarean section, and had the ligature been used he believed in one case the child would have been lost from cutting off of the circulation. He thought the use of the rubber ligature in these cases was being done away with. He agreed with Dr. Vander Veer that hemorrhage was slight if the incision was made across the fundus of the uterus from one corner to the other.

Dr. Schwarz, in closing the discussion, said, with reference to the location of the incision, that while in some cases special incisions might seem preferable, after trying incisions crosswise over the fundus, or any other incision, posteriorly or anteriorly, the majority of obstetricians had returned to the anterior incision, regardless of the location of the placenta.

With regard to the use of the elastic ligature, Dr. Skeel must have misunderstood him, as he said the ligature was placed loosely around the neck of the womb, not sufficiently tight to interfere with circulation.

APPENDICITIS AS A FACTOR IN THE DIAGNOSIS AND TREATMENT OF ABDOMINAL AND PELVIC TUMORS—ALSO COMPLICATING PREGNANCY.*

BY
RUFUS B. HALL, M.D.,
Cincinnati, Ohio.

I THINK I voice the sentiment of the majority of men engaged in our special work when I state that appendicitis when associated with pelvic or abdominal tumors, or the pregnant woman, has not been given the attention that the subject deserves. The writer has been convinced of this fact on many occasions, greatly to the misfortune of the patient. In discussing this subject, if we could draw the attention of the profession more forcibly to the early recognition of the cardinal signs of appendicitis in these cases, we would render a service to humanity. At the present time they appear to assume that when a patient grows suddenly ill, who is known to have a tumor in her pelvis or abdomen, there is something wrong with the tumor, and that a few days' quiet and medication will right the difficulty—when they will have the necessary operation performed.

All operators know that, in a large majority of instances where a patient is suffering from a pelvic or abdominal tumor, and becomes suddenly ill, the illness is caused by some pathological change in the tumor or torsion of its pedicle. They also know that in a small per cent. of these cases appendicitis may and does develop independent of the tumor, and if this is overlooked, it may cost the patient her life.

It is for this reason that I have written this short paper with the hope that we will have the characteristic free discussion of the subject by this association for which it is noted, and, thereby, bring the subject more prominently before the profession. Just how frequently appendicitis goes on to the formation of an abscess in a given number of patients suffering from tumor is a subject that would require a compilation of a large amount of clinical material. I shall make no attempt to solve this question even approxi-

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mately, but I am convinced that it is a condition that should always be kept in mind and given due consideration in dealing with every case of tumor complicated by an acute illness. If appendicitis were suspected as a cause of the acute illness in all of these patients, in the writer's judgment there would be little difficulty in making a correct diagnosis in almost all cases.

The clinical history and the characteristic pain does not differ in appendicitis associated with tumor from appendicitis where no tumor is present, and the writer is convinced that when these facts are emphasized, and the attention called to this subject, the profession will recognize appendicitis complicated with tumor as readily as it now does simple appendicitis.

In differentiating appendicitis when it is associated with the tumors in the abdomen, it has occurred to the writer that he could express himself more clearly if he would take each condition associated with an acute attack, and point out the leading symptoms from which a correct diagnosis might be made, especially in reference to cases progressing to the formation of an abscess. The writer has had to deal with acute attacks going on to suppuration associated with fibroid tumors of the uterus and large ovarian cysts, pyosalpinx and the various other pelvic conditions, as well as that complicating pregnancy. In almost every instance, appendicitis was not diagnosed or even suspected until the patient was referred for operation.

Appendicitis going on to suppuration has been met with by the writer very much more frequently in large neglected fibroid tumors of the uterus, than in any other pathological condition in which it has occurred as a complication associated with abdominal or pelvic tumors. It ought not to be difficult to make a correct diagnosis of appendicitis when associated with fibroid tumors of the uterus, but, in many cases, there has been a history of long years of suffering of metrorrhagia and several attacks of pelvic peritonitis preceding the attack of appendicitis. Thus, the physician in charge very naturally attributed the attack of appendicitis to be one of the old attacks of recurrent peritonitis, from which the patient had so often suffered. Those of us who are familiar with the clinical history of these patients know that they are confined to their bed in varying periods from ten days to three or four weeks with these attacks, with a temperature varying from 100 to 102 for a day or two at the commencement of the illness. The tumors are fixed in the pelvis by dense and firm adhesions after these repeated attacks of inflammation, and the patients are more

or less invalids for weeks afterward. It has been this clinical history that has obscured the diagnosis of appendicitis in all of these cases. It is only necessary to carefully study and comprehend the clinical history of these patients to be better able to make a correct diagnosis.

In acute attacks of appendicitis, the onset of the attack is more abrupt, and the patient is more dangerously ill early in her illness than she is in peritonitis caused by her tumor alone. The attack is more sudden and all the symptoms are more aggravated. In peritonitis not associated with appendicitis, the pain is not localized as it is in appendicitis. When appendicitis is present, the peritonitis may become general, but, after the first twenty-four hours the pain always becomes localized in the region of the appendix. This is not true of peritonitis associated with a fibroid tumor. A patient suffering from peritonitis caused by a fibroid tumor usually has the reverse history. She goes to bed with the pain and temperature of 101°, with general pelvic discomfort, and it is one or two days before the whole abdomen becomes rigid and tender, and the pain never becomes localized as it does in appendicitis. It is so unusual for a patient with a fibroid tumor to have torsion of the tumor, and a sudden illness from this cause that it may be almost wholly ignored by the diagnostician, and again, the symptoms from torsion would not be those we have in acute appendicitis going on to suppuration. Still again, as a rule, on the third or fourth day of the attack of appendicitis, a well-defined mass can be made out in the region of the appendix, which did not exist before the attack. As the disease advances to the eighth, ninth or tenth day, this mass becomes greatly enlarged. The temperature chart and the general condition of the patient indicates the presence of pus.

In appendicitis, the patient has steadily grown worse after the third day, up to the tenth or twelfth day, while in peritonitis caused from the tumor, the patient's condition has generally gradually improved after the third day. In peritonitis, due to a tumor, we do not have the rigors or the sweats which are present in the cases of appendicitis going on to suppuration.

In fibroid tumors, associated with hematoma of the ovary, having repeated attacks of pelvic peritonitis, the ovary is always imprisoned in the pelvis below the tumor. In this condition, the pain is localized at the seat of the hematoma, and the symptoms are very different from those of appendicitis. The acute attacks in an infected hematoma, associated with a fibroid, are not so

abrupt as in appendicitis. By careful bimanual examination in hematoma there is no difficulty in making out the presence of a localized swelling below the fibroid tumor, which is not so hard as that of the tumor, and always very sensitive on pressure. This may be located either on the right or the left side, and in those cases where it is on the left side, the elimination of appendicitis is at once made easy. In hematoma, the acute attack may last two or three weeks, and the temperature ranging from 100 to 101 or 102, or even higher at times, while in appendicitis going on to suppuration, we have the same clinical history of suppuration that is always present in cases that are not complicated by a tumor.

The differentiation of appendicitis complicating ovarian tumor is not difficult, excepting in one of two conditions which are likely to be confounded with appendicitis, and those only in the early part of the illness. In those cases where the patient has sudden torsion of the pedicle, the symptoms are frequently very abrupt. The patient becomes very ill within twelve or eighteen hours. The abdomen becomes rigid and very sensitive to pressure, and the patient complains of great pain. The pulse is accelerated, the patient lies with the limbs drawn up, and the general condition might be mistaken for appendicitis. The pain is not localized, nor does it become localized in this condition. The temperature does not rise, during the first two or three days of the illness, as high as it does in appendicitis, and very frequently the temperature in this condition is not above 99 or 100 degrees. The tumor rapidly increases in size and becomes firmer and less elastic than before. The patient may grow rapidly worse and her condition become very alarming in three or four days' time. Her pulse is rapid, and her general condition has the appearance of impending death, but the temperature remains practically normal. The writer has seen this condition diagnosed as appendicitis.

Another condition might be mistaken for appendicitis, and that is a rupture of the cyst. In some instances the symptoms are so pronounced that a diagnosis is easily made, especially, if an injury has been received. The profound shock that frequently accompanies rupture, if it is present, aids in the diagnosis, and the changed condition in the outline of the tumor can nearly always be made out, and if so, aids very much in clearing up the diagnosis. But in other conditions we have rupture when the fluid is comparatively non-irritating and the symptoms not so well defined. This may be confusing for a few days early in the history

of the case, but a careful watch for the cardinal signs of appendicitis will put one on their guard and make the diagnosis plain.

We occasionally observe appendicitis develop in connection with long-standing suppuration of the tubes, and when it does occur the condition is very confusing but not impossible to differentiate correctly if one interprets the symptoms aright. In long-standing tubal diseases, we have a clinical history that we are all familiar with, a long period of invalidism with repeated attacks of pelvic inflammation and not infrequently general peritonitis. These attacks confine the patient to her bed for a week or ten days to four or five weeks. By bimanual examination, a well-defined induration can be outlined at one or both sides of the uterus. After the first twenty-four or thirty-six hours, the patient's condition is not so alarming. The temperature may fluctuate during her entire illness, but the symptoms are not so serious as those we have in acute appendicitis. She may have a tender point in the right half of the pelvis, but the lump extends farther down in the pelvis in this condition than it does in an appendicitis that goes on to suppuration. Again, in appendicitis, the pain becomes localized after the first twenty-four hours in the region of the appendix, and if the case goes on to suppuration, a well-defined mass can be outlined in this region within the first four days. The patient's condition is more alarming in appendicitis and continues so throughout the illness, than it is in pyosalpinx, excepting perhaps one or two days in the first part of the illness.

The diagnosis of appendicitis, associated with pregnancy, does not present any difficulties that are likely to be present in the non-pregnant woman, and I do not present the subject here with the idea of saying anything new, but simply to call attention to the fact that we may and do have appendicitis in pregnant women that may go on to the development of an appendicular abscess. This complication is one of the gravest that may befall a pregnant woman. It is not so much the diagnosis of appendicitis associated with pregnancy that concerns us, but the management of these patients is of the greatest importance. To formulate a working rule and have the profession united upon it, occurs to the writer as of the first importance. We may be divided in our opinion as to the advisability of an operation in the first attack of appendicitis in the non-pregnant patient, especially if we are called on the third or fourth day of the attack, as we frequently are, but let us be united as to an immediate

operation in the pregnant woman. There is much to be said for and against an operation in select cases, if the consultant is called on the third or fourth day, and it is due to the wise decision in many cases, that we avert a calamity, but when we come to deal with appendicitis associated with pregnancy, we have a graver condition to consider. If the patient was not pregnant, and the first attack a comparatively mild one, and the consultant called the third or fourth day, it might be wise in many cases to postpone an operation until the patient recovered, or, if the abscess is forming, until the abscess is better protected or walled off. But if the patient is pregnant and this supposed conservative measure is adopted, any time after that premature labor comes on, and there is a walled-off abscess, the barrier is broken down during labor, the general peritoneal cavity is infected and the patient dies of septic peritonitis, two or three days after delivery.

This is not an imaginary picture, but one the writer has witnessed upon three different occasions within the past three months. He was called to operate them when they were past relief. He believes that all of these patients' lives could have been saved had the operation been made any time prior to the commencement of labor. They might have aborted afterwards, even their condition need not necessarily be so desperate and their chances of recovery would have been vastly better than the conservative method. The writer is convinced of the fact that every pregnant woman who is the subject of appendicitis, should be operated just as soon as the diagnosis is made, whether the attack is the first, second, or third attack. The consultant may see the patient two or three days after the attack commences, when her condition may be unpromising for an operation, nevertheless, the writer would urge an immediate operation, as the least dangerous for the patient, for their premature labor might come on, liberating the infection, and she might die from general peritonitis.

I have operated upon a number of patients in various stages of gestation during the acute attacks of appendicitis with very gratifying results. The general profession is not impressed with the great importance of an immediate operation in these cases, as it should be. If he can induce others to operate upon the pregnant woman who is a subject of appendicitis immediately after the diagnosis is made, he will feel that he has rendered a service to the profession. The treatment of appendicitis, complicated with fibroid tumors, ovarian tumors and tubal disease, may be made

more conservatively regarding immediate operation, if the consultant feels the necessity of doing so. In other words, if the diagnosis of appendicitis is not complete until the third or fourth day, in many of the cases it is probable that it would be good surgery not to operate upon the patient during the height of the acute attack, but to wait until it subsides, or to wait until an abscess is walled off. The danger of the barrier being broken down here does not pertain as in the pregnant woman. If we could not have an early operation which should in every instance include the radical one for removal of the tumor, if that be a fibroid or ovarian or pus tube, the case should be treated as if no tumor existed.

The writer has operated in every instance, making a radical operation for removing the tumor also, just as soon as the diagnosis was made, and he has never regretted doing so.

628 Elm Street.

DISCUSSION.

Dr. Charles A. L. Reed, in opening the discussion, stated that he was called about two years ago to make a trip in the night, arriving at a farmhouse about two o'clock in the morning, and found a woman who had symptoms of active appendicitis in the presence of a seven and a half months' pregnancy. He operated upon the woman; she went to term, without any interruption of labor.

He recalled two other cases in which he had operated in the presence of pregnancy, more or less advanced, and in neither instance was there any interference with the progress of gestation.

Dr. John Young Brown thought the indications for operation in appendicitis associated with pregnancy were equally as strong as the indications without pregnancy. Some months ago a woman, five months pregnant, was admitted to the City Hospital suffering from an ovarian cyst of the left side, which he removed without any interference with the pregnancy. It was his custom, when he opened the abdomen, to remove the appendix, but the fact that this woman was pregnant prompted him to leave the appendix. Four weeks after this the patient was admitted with a fulminating appendicitis, his assistant removed a perforated appendix, the woman was still pregnant, and the operation had not interfered with pregnancy. She made a nice convalescence from the operation. He thought this case emphasized the importance of removing the appendix whenever the abdomen was opened for some other pathological condition.

Dr. Orange G. Pfaff, of Indianapolis, Ind., said that the most practical and valuable point brought out by the essayist was not only that appendicitis complicated pregnancy, but it was one of the complications which occasionaliy arose after delivery. He reported the following case: A physician, who

had treated a case with every precaution, found that on the third or fourth day after confinement the patient had a rapid pulse and high temperature, with pelvic pain in the right side. There was general distention of the abdomen. He recognized in a few days the presence of pus in the pelvis. The speaker was asked to see the case. Without much difficulty an abscess was located on the right side. He demonstrated that both culs-de-sac were free; he made an incision above McBurney's point, and demonstrated that there was an appendiceal abscess which had undoubtedly developed from the traumatism incident to the delivery. The patient gave a history of previous attacks of indigestion.

Dr. Hall, in closing the discussion, said that he would feel repaid for his labor if the dictum could go out from the association that pregnant women could be operated on for appendicitis as soon as a diagnosis was made, and not to wait in the hope that the abscess would be walled off, and not to wait as one would in a non-pregnant woman. Even if the consultant was called in late, the woman had a better chance to get well with an operation then than to wait. If the appendix went on to suppuration the woman was more likely to abort than afterward.

Dr. Magnus A. Tate, of Cincinnati, O., read a paper on

PREGNANCY ASSOCIATED WITH DIABETES.*

Dr. Orange G. Pfaff read a paper entitled

FURTHER CONSIDERATION OF MESENTERIC CYSTS, WITH REPORT OF TWO CASES.*

Dr. Charles A. L. Reed, of Cincinnati, Ohio, contributed a paper on

EXTRAPERITONEAL PREGNANCY,*

which was read by Dr. Lewis S. McMurtry, in the absence of the author.

Dr. Charles L. Bonifield, Ohio, said he was sorry Dr. Reed was not present, as he would like to ask him how one could tell whether the pregnancy was extraperitoneal or intraperitoneal before the abdomen was opened. Personally he had never been able to do so.

He recalled two interesting cases of extrauterine pregnancy. The first one was operated upon three or four years ago. The patient gave a typical history of extrauterine pregnancy and of false labor, and she finally came under his care for a large fibroid which proved to be undergoing sarcomatous degeneration. In this case the fetal bones (subperitoneal) were supposed to have been carried for seventeen years. One ovary contained a small dermoid cyst on the right side. The skeleton was large.

The other case was one in which, so far as one could judge from microscopical examination, the fetus developed at term

*To appear later.

within the Fallopian tube. He operated on this case about a year ago. The woman was in labor in the evening; he went the following morning and did the operation, giving the woman a hypodermic injection of morphia to make her comfortable. The uterus and gestation sac were removed *en masse*. While the hemorrhage was free, it was controlled without much difficulty. The child was still alive, and seemed to be of ordinary intelligence.

Dr. Louis Frank reported a case which was typical of the extraperitoneal variety, the sac having developed in the left broad ligament, the fetus lifting up the peritoneum, so that the placenta was largely attached to the posterior surface of the uterus and in the broad ligament on the left side. The connection between the sac and the point of rupture of the tube was still evident in the specimen. This woman had had difficult labor pains, and was abandoned by her medical attendant in the country because he felt there was obstruction and the child could not be delivered. The woman was left alone. After several days the discharge and pain ceased. Five or six months later the patient was sent to the speaker's clinic. With the exception of a history of missing labor, there was hardly anything to indicate that a fetus had been developed. The woman was not sure. She had given no symptoms of any trouble during pregnancy whatsoever. An *x*-ray examination showed nothing for diagnostic purposes; still with the history he believed it was a case of ectopic pregnancy and operated. After the sac was opened an attempt was made to separate the placenta. Even at this time the hemorrhage was quite copious, and it was decided the plan to carry out was complete extirpation of the sac and uterus, doing a complete hysterectomy. The woman developed a fecal fistula, but otherwise her convalescence was uneventful and she left the infirmary at the end of the third week.

Dr. Frank cited another case in which the fetus developed inside the peritoneal cavity itself.

Dr. J. Henry Carstens had noticed that the longer the fetus was dead, the better the case was to operate upon The placental circulation was entirely stopped as a rule. In cases of long standing one could peel out the placenta without any trouble. If sepsis had developed, not only the placental circulation had been stopped, but absorption had taken place, with, perhaps, more or less fatty degeneration. One could clean the thing out and drain the sac. Sometimes one might be able to take out the whole thing—sac, fetus, placenta, etc. He had a case where the fetus had been dead for three years.

Dr. McMurtry, in closing the discussion for the author of the paper, stated that there had been a great many cases of extrauterine pregnancy reported at term, and after term, regardless of the disposition of the sac. In the Transactions of the Association some years back he contributed an interesting case in which operation was done after a spurious labor, removing a dead fetus.

He recalled one case reported which seemed to be promising, where the plan of marsupialization was carried out and death occurred from hemorrhage from the placenta afterwards. The placenta broke down, and the baby died. Cases were reported in the earlier period of ectopic pregnancy where the fetus was extensively developed, and success followed the enucleation of the placenta in some of them.

Some of the early cases, he said, were reported by the late Dr. Eastman, of Indianapolis, illustrating this point, and an impression prevailed to a certain extent in the profession at that time that in all cases the thing to do was to remove the placenta. In the majority of cases this was practicable. Tait called attention to the fact that it was a long time after the death of the fetus before extensive changes took place in the vessels of the placenta, and he maintained in some instances there were strong evidences that the placenta enlarged after the death of the fetus. But the whole tendency of modern teaching was toward the establishment of an invariable rule to leave in the placenta.

The object of Dr. Reed's paper was to point out those exceptional cases where the best welfare of the patient would be subserved by a less radical procedure, and, as the essayist had stated, no rule could be formulated, but what the anatomical pathological condition revealed at the operation should indicate the procedure of choice at the time. He had no doubt that a good purpose would be subserved by the publication of this paper in indicating that there remained a class of cases of ectopic pregnancy near, at, or after term in which the best results could be obtained from a less radical procedure, and from stitching the sac and allowing time to elapse before removing it.

Officers.—The following officers were elected for the ensuing year: *President*, Dr. John Young Brown, St. Louis, Mo.; *Vice-Presidents*, Dr. James N. West, New York, and Dr. Frank F. Simpson, Pittsburg, Pa.; *Secretary*, Dr. Wm. Warren Potter, Buffalo, N. Y (reelected); *Treasurer*, Dr. X. O. Werder, Pittsburg, Pa. (reelected); *Members of Council*, Drs. Robert T. Morris, New York, and Howard W. Longyear, Detroit, Mich.

REVIEWS.

PHYSICAL DIAGNOSIS. By RICHARD C. CABOT, M.D., Instructor in Medicine in Harvard University. Third Edition, Revised and Enlarged. Pp. 577. With 5 plates and 240 figures in the text. New York: William Wood and Company, 1905.

Since its last appearance, in 1903, this work has grown from one on physical diagnosis of diseases of the chest to one on physical diagnosis in general. To the former contents are prefixed chapters on the body as a whole, the head, face, neck, back and chest. In the older portion few changes are noted save the insertion of sections on examination of sputum and on cyto diagnosis of pleural and other effusions. Throughout the book clinical tests, few and reliable, are inserted in the text, the author's idea being that they are merely aids to diagnosis and as such should be considered in direct connection with their practical applications rather than as isolated subjects. The chief additions are the sections on physical diagnosis of the abdomen and its viscera, the blood, joints and nervous system. They maintain the characteristics of the work's predecessors—brevity, simplicity and directness of statement. These are the qualities essential to a work intended for students, and as such it deserves hearty commendation. H. D.

LABORATORY MANUAL OF PHYSIOLOGY. By FREDERICK C. BUSCH, B.S., M.D., Professor of Physiology, Medical Department, University of Buffalo. Pp. 206. Illustrated. New York: William Wood and Company, 1905.

This manual is characterized by the greatest possible simplicity. It contains chiefly directions for the performance of experiments, leaving the student to make his own observations and to draw his own deductions.

MANUAL OF THE DISEASES OF THE EYE. For Students and General Practitioners. By CHARLES H. MAY, M.D., Chief of Clinic and Instructor in Ophthalmoscopy, College of Physicians and Surgeons, Columbia University, 1890-1903; Ophthalmic Surgeon to the City Hospitals, Randall's Island, New York; Consulting Ophthalmologist to the French and Red Cross Hospitals; Adjunct Ophthalmic Surgeon to Mt. Sinai Hospital. Fourth Edition, Revised. Pp. 391. With 360 original illustrations, including 21 plates with 60 colored figures. New York: William Wood and Company, 1905.

The esteem in which this worthy little book for students and general practitioners is held is shown by its recent publication in London and the appearance of German and Italian translations. The chief alterations in the present edition consist in substitution of original illustrations for diagrammatic figures, and of colored plates representing the external diseases of the eye. These are of unusual excellence and greatly enhance the value of the volume. It

is to be hoped that the author, having produced such an admirable work for students and general practitioners, will be satisfied to let it remain such, and not feel tempted to enlarge it into a volume for the specialist. The present book has a field to fill and does it most satisfactorily. H. D.

DISSECTING MANUAL. Based on Cunningham's Anatomy. By W. H. ROCKWELL, JR., M.D., Formerly Assistant Demonstrator of Anatomy in the College of Physicians and Surgeons, Columbia University, New York. Pp. 306. New York: William Wood and Company, 1905.

In this little work the author gives a brief description of the structures encountered by the dissector. It is divided into chapters corresponding to the "parts" usually assigned to the student, and in each of these the bones, articulations, muscles, vessels, nerves, etc., are grouped together. The subject is treated from the standpoint of the beginner in dissection, and is especially suited to those using Cunningham's Anatomy as a text-book, since references are given at the end of each paragraph to the corresponding page in the new edition of the larger work.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Infants Smothered in Bed.—It is stated (*Brit. Jour. Children's Diseases,* June) that in 1903 there were 1629 deaths attributable to this cause, 600 of them being in London. The opinion is held that these are due to ignorance or carelessness of affectionate parents who wish to have the children in bed with them instead of on separate cots. One coroner has made it a rule to order an autopsy in every case in which a child dies from this cause, hoping to impress the community with the need of care.

Treatment of Enuresis in Children.—The first consideration is to find and remove the causes, which are tabulated by N. P. Barnes (*Amer. Med.,* June 24). Most important are diet, hygiene, habit, and training, rewarding the child for good conduct and appealing to its pride. Regularity of diet, exercise, sleep, and evacuation of rectum and bladder are imperative. Children should be taught to hold the urine for a considerable time during the day and be awakened to urinate at a regular hour at night. Gradually cooled baths increase vigor. A hard bed, moderate covering, elevation of the foot of the bed, and appliances to prevent lying on the back are rational. If the urine is highly acid, potassium citrate, lithium salicylate, etc., give relief. For general atonic conditions and weakness of sphincters, strychnine, quinine and ergot are used. Atropin must be given in increasing doses for weeks or months and tapered off. If masturbation is practised, full doses of gelsemium, sodium bromide and circumcision are of value; sounds and the Faradic current may help. Irritat-

ing the urethra with cantharides or silver nitrate may benefit, though these may cause posterior urethritis. Bladder washing and stretching are important if there is vesical contraction.

Operative Treatment of Hip-joint Disease.—T. W. Huntington (*Amer. Jour. Med. Sci.,* July) says that with a focus in the head or neck of the femur encroachment upon the synovial cavity or perforation is to be expected. A cure for hip-joint disease which establishes something better than permanent fixation, with the avoidance of synovial invasion and joint destruction will probably be found in a bold attack upon the original seat of the disease in its very incipiency. With this in view he has planned and executed the following operation: A trephine opening about one-half inch in diameter is made on the outer aspect of the thigh at the lower border of the great trochanter. Through this opening, with a small bone curette, the neck of the femur may be tunneled to a depth of from one to two and a half inches. At this depth the epiphyseal cartilage separating the head from the neck will be encountered. If there be any evidence of a focal lesion external to the epiphyseal cartilage, further encroachment may be unnecessary. It is extremely desirable not to interfere with this cartilage if possible to avoid it, for the obvious reason that such interference will materially affect, if it does not positively arrest, future development. If it be necessary to enter the head of the bone, this should be accomplished by a perforation made with a small instrument, thereby establishing a channel of communication between the head and neck, through which, as a line of least resistance, a distant focus may be drained. The writer is not prepared to advocate extensive curettement of the head. While recognizing the value of the criticism that unless the disease at the head of the femur is well localized and walled off from the epiphysis of the joint, and unless the surgeon avoids injuring the protecting wall of cicatrized bone tissue, an extension of the tubercular process may follow, he does not consider this a bar to the procedure. He has applied the principle successfully in two cases. In the first, a boy of 16, the first symptoms began five weeks before. Through an opening made in the great trochanter a curette was passed through the neck of the femur, and entered a cavity filled with pus. Fever, pain and tenderness were relieved at once. Within a month he was about on crutches. A year later he had gained twenty pounds and had some mobility of the joint with three-quarters of an inch shortening. General health excellent. Case II.—A boy of 11 years was operated upon five days after the acute onset, which had occurred when in his usual health. No pus was obtained then or at a second operation seven weeks later, when the channel in the neck of the femur was deepened. During the first six weeks a plaster dressing was worn, and after the second operation traction was employed. Two weeks after the latter operation pus began to discharge through the opening, and symptoms gradually disappeared. At the end of nine months the leg was almost normal in contour, relationship, length, and function.

Separation of Descending Process of Upper Tibial Epiphysis.—G. H. Makins (*Lancet,* July 22)) records three cases of this injury, two following kicks in the region of the knee. The chief symptoms of the condition are a "giving way" of the knee at times; later, pain, variable in amount and continuity, but liable to occur after "giving way" of the knee or on the first movement of the leg after it has been at rest for some time in one position; local tenderness on palpation or kneeling; swelling due to local edema; occasionally reddening of the skin. The lesion is caused by violent contraction of the quadriceps extensor, the kick in two of the cases reported probably resulting in a violent reflex contraction of that muscle.

Spina Bifida.—James E. Moore (*Surg., Gyn., and Obst.,* Aug.) presents a study of three hundred and eighty-five cases, of which reports are on file in the Library of the Surgeon General. He concludes that operation upon children of very tender age is scarcely worth while, because it is accompanied by a high mortality and because it does not arrest the progress of advancing cases. Patients five or more years of age can be operated upon safely. Patients with large or rapidly growing tumors, with hydrocephalus, and with paralysis or deformities of the extremities are not cured. All that can be hoped for in such cases is to relieve the patients of unsightly tumors.

Presence of Spirochætes in the Lesions of Syphilitics.—Galli-Valerio and A. Lassweur (*Revue Med. de la Suisse Romande,* July 20) have examined the syphilitic lesions of ten cases of syphilis, and give the following results of their observations: 1. In the condylomata of one syphilitic, and in the mucous patches of five cases they found spirochætes four to ten μ long, presenting the characteristics of spirochæte pallida, in considerable quantity in one case. The germs stained after nine to twelve hours with the azure of Michaelis. 2. In one case they found no spirochætes in the mucous patches, nor in the lymph nodes or the hard chancre. Two varieties of spirochæte exist, spirochæte refringens, which is large, and rather undulating than spiral, is easily stained with aniline colors. Spirochæte pallida is thin, four to fourteen μ long, has ten to fourteen spiral waves, and stains with difficulty with azure. Refringens has probably nothing to do with syphilis, while pallida is probably the cause of syphilitic lesions. It has been found by several observers in syphilitic lesions, both in man and the ape, and in no other lesions. It has been found in the bullæ of syphilitic pemphigus of a child that died at 10 months of age of hereditary syphilis; the bullæ had not been previously opened. It was found in the spleen, lungs and liver of the same child. It has been found in four cases of glandular swellings of syphilitics, and in the primary sore and mucous patches of several cases.

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DISEASES OF WOMEN AND CHILDREN.

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ORIGINAL COMMUNICATIONS.

FUNDAMENTAL PRINCIPLES OF IMMUNITY.*

BY

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Chicago.

We continue to be very ignorant concerning many of the phenomena of immunity, susceptibility and infection in spite of the astounding mass of facts which has been disclosed by laborious investigations during recent years. From what at first appeared to be an easy road to the mastery of all infectious diseases, we have come to face many enigmatic conditions; yet it would be strange if one were not able to formulate a few important principles on the basis of the accumulated facts.

We should demand of principles which may be formulated not only that they classify our knowledge, but also that they explain some of the apparent anomalies with which we are familiar. For example, why is the antitoxin of tetanus so impotent in the treatment of tetanus while an analogous antitoxin, that of diphtheria, is so efficient? And why are the bactericidal serums so low in their curative value, although in test-tube experiments they are able to kill large numbers of the corresponding organism, etc.?

* Read by invitation, before the Chicago Gynecological Society, June 23, 1905.

Numerous examples of natural and acquired immunity were recognized long before there was any accurate knowledge of the causes of infectious diseases. It was known that an individual did not contract syphilis, smallpox and plague a second time, and that one could protect an individual against smallpox by inoculation with a benign form of the disease or by vaccination as practised to-day. Manifestly nothing more than a limited empirical knowledge was possible, and few advances could be made, so long as the etiology of the diseases was unknown. Hence we must mention as the first step in our recent progress the work of Devaine, Koch, Pasteur, and others in demonstrating that infectious diseases are caused by microorganisms, and that each disease has its own specific microbe. Following this, Pasteur found that he was able to extend the principle of vaccination from smallpox to other diseases, using as his vaccine pure cultures of the causative organisms, after the latter had been suitably attenuated in their virulence. This was successfully accomplished in relation to chicken-cholera, anthrax, and later hydrophobia.

In attempting to discover the conditions in the body which underlie natural immunity to bacteria, Nuttall, Buchner and others found that the blood and the serum of animals often were able to kill bacteria in reagent-glass experiments. One naturally supposed that this same property in the body would account for many examples of natural immunity. Buchner called the protective substances alexines, substances which ward off, and described some of their properties, one of which was the ease with which they were destroyed by light, air and heat (55° C.). In a similar manner Behring, Bouchard and others showed that the serum of animals which had been vaccinated or immunized with certain organisms, acquired an increased bactericidal power for the bacterium which was used in the immunization. Hence it seemed a reasonable assumption that alexines were also responsible for some examples of acquired immunity. The bactericidal property of serum appeared all the more significant when it was proven that the serum of an immune animal, injected into one which was not immune, would often protect the latter from infection by the corresponding organism. It was learned that the immune bactericidal serums are specific in their action on the homologous organisms.

The conditions, however, proved not to be so simple as the first experiments seemed to indicate. In the case of experi-

mental cholera Pfeiffer obtained an insight into the mechanism of the action of the immune serum—in this instance anticholera serum. When some of the immune serum was mixed with the vibrio of cholera, and the mixture injected into the peritoneal cavity of a guinea-pig the microbes gradually underwent complete solution; this is called the phenomenon of Pfeiffer. Not all organisms are so completely dissolved under these circumstances, however. In the course of his experiments, Pfeiffer found that the bactericidal power of a serum in test-glass experiments did not always go hand in hand with its protective power in animal experiments. In fact, anticholera serum may lose all its bactericidal power for experiments in vitro, but at the same time show its original bactericidal or protective action when injected into an animal. Hence he concluded that the protective substance in serum is in an inactive form, and that it becomes active in the body of an animal only by virtue of some peculiar influence which the living cells exert on the immune serum.

The true condition was not realized until Bordet showed that the alexines of Buchner really consist of two substances, one of which is very labile, whereas the other resists fairly high degrees of temperature. We now know that both normal and immune bactericidal serums kill bacteria only through the combined action of these two substances, which we see in literature under the names of complement and amboceptor.

In the meantime it had developed that immunization with certain microbes did not cause the formation of bactericidal serums, and that bactericidal serums did not protect against the toxic constituents of the homologous bacteria, although they were abundantly able to kill the organisms.

A closer study of the properties of bacteria brought to light the existence of a small group of organisms which secrete soluble toxins in liquid culture media and in the body of the infected animal. Each of these organisms, of which the bacilli of tetanus and diphtheria are the best known examples, produces its own specific toxin, and to the action of the toxins alone are due the characteristic phenomena of the diseases.

Following close on these observations came the historic discoveries of Behring and Kitasato, that immunization with these soluble toxins causes the formation of specific antitoxins, and that the serum of the immunized animal is able to protect a susceptible animal from the injurious action of the toxin, steps

which have led to the present antitoxic therapy of diphtheria and tetanus.

Continued investigations soon made apparent the necessity of distinguishing between antitoxic and antibacterial immunity. Antitoxic serums, which are obtained by immunization with soluble toxins, have no power of destroying the corresponding organisms. And immunization with another rather larger group of organisms, the members of which do not produce soluble toxins, results in the formation of serums which are bactericidal, but which have no power of neutralizing the toxic constituents of the homologous bacteria. Hence the distinction between antitoxic and antibacterial immunity, insofar as they depend on the properties of serums, is a sharp one.

These two types of immunity have to do with properties which are demonstrable in the serum, and our subject would to-day be a much simpler one if all examples of natural immunity, recovery from infection and acquired immunity could be explained on the basis of such demonstrable properties. When one recovers from infections with the pneumococcus, streptococcus or staphylococcus, the temporary immunity for which recovery stands, is characterized by the development of neither bactericidal nor antitoxic serum properties. On the other hand, clinical and experimental observations point very strongly to phagocytosis as an important factor in recovery from these infections, in considering which one is brought into close touch with Metchnikoff's phagocytic theory of immunity.

Roughly, therefore, we may classify bacteria into three main groups, having in mind the character of the immunity to which they give rise. I say roughly because all microorganisms do not as yet find a satisfactory place in the classification, and a few would appear in two or perhaps in all three of the divisions. Nevertheless, such a provisional classification is useful from the standpoint of simplicity.

Group I. includes a small number of organisms which secrete soluble toxins, immunization with which causes the formation of specific antitoxins. Recovery from infections with these organisms is characterized by the presence of antitoxins in the serums of the patients. The immunity is antitoxic. Such organisms are the bacilli of tetanus, diphtheria, botulism and Bacillus pyocyaneus.

Group II. includes a fairly large number of organisms the members of which are characterized, first, by their inability to form

soluble toxins, immunization with which causes the formation of antitoxins; second, their ability during disease or as a consequence of artificial immunization to cause the formation of specific bactericidal serums; and, third, the integral association of their toxic constituents with the bacterial protoplasm. Their toxic constituents are spoken of as endotoxins. It is generally believed that immunity to these organisms depends entirely on the action of the bactericidal amboceptors and complements of the patient's serum. Their antiserums do not neutralize the toxic constituents, the endotoxins, of the bacteria. The typhoid, paratyphoid, colon, dysentery and plague bacilli and the vibrio of cholera are the best known representatives of this group.

Group III. includes organisms which, first, do not produce toxins, immunization with which causes the formation of antitoxins; second, recovery from infection and deliberate immunization with the bacterial cells are not accompanied by the formation of bactericidal substances; and, third, the toxic constituents are fixed endotoxins. We may include as prominent members of this group the streptococcus, staphylococcus, pneumococcus and the tubercle bacillus.

Inasmuch as the streptococcus produces, in culture media, a toxin for erythrocytes, and the staphylococcus toxins for both erythrocytes and leucocytes, the propriety of placing them in this group may be open to question. However the results of investigation seem to justify the belief that these toxins are but mere incidents in the pathogenicity of the organisms and that they do not represent the essential toxic substances. Although immunization with these toxins does result in the formation of specific antitoxins, it remains true that no one has yet produced antitoxins of convincing efficiency in combating the infections. Tuberculin, a toxic constituent of the tubercle bacillus, is not a true toxin, if with Ehrlich we agree to consider as true toxins only those immunization with which causes the formation of antitoxins. Tuberculin is an endotoxin and passes into solution only after disintegration of the bacilli.

Infection with certain members of the third group is accompanied by hyperleucocytosis and at least in pneumonia the character and course of the leucocytosis is generally considered to be of some prognostic importance. The tendency is very strong to believe that recovery from these infections, and the temporary immunity for which recovery stands are due to the phagocytic and digestive action of the polymorphonuclear leucocytes. In

other instances, as in tuberculosis, in which the polymorphonuclear leucocytes remain in the background, recovery is often due to the tissue reaction at the point of infection. Giant-cells and endothelial cells certainly ingest tubercle bacilli, but we must also consider the new formed fibrous tissue as an important factor in local healing.

Accordingly, immunity to infections by members of the third group is, in a peculiar sense, cellular, if we may be so radical as to stand on the probabilities in the case.

We may now inquire into certain principles which are manifest in the action of antitoxic and antibacterial serums, and in doing so it becomes necessary to consider briefly the side-chain theory of immunity, for only the theory of Ehrlich offers an intelligible explanation of their action.

Ehrlich began the study of immunity with work bearing on the method by which antitoxins neutralize toxins, the nature of toxins and antitoxins and the origin of the latter. He became convinced of a fact which is now generally recognized, that neutralization of toxin by antitoxin is accomplished by chemical union of the two substances. The neutralization obeys certain chemical laws, such as union in equivalent proportions, acceleration of union by heat and its retardation by cold. Antitoxin does not destroy toxin, but a new molecule, the toxin-antitoxin molecule is formed; of this we need not cite the experimental proof. If such union occurs it must be through definite groups of atoms which the two molecules possess; for chemical union would be impossible without such binding groups which Ehrlich calls the haptophorous groups or simply haptophores.

The action of toxin on a cell, according to Ehrlich, must be preceded by chemical union of the toxin with some constituent of the cell. Hence union of toxin with cell is analogous to union of toxin with antitoxin, and it is reasonable to assume that the cellular constituent with which toxin unites has certain properties in common with the extracellular substance (antitoxin); their binding powers for toxin are identical, and if by some means the cellular constituent could be set free into the circulation, retaining its binding power, it would fulfill the requirements of an antitoxin. This is exactly what occurs according to Ehrlich. In other words "That substance which is the prerequisite for intoxication, in the cells of the living body, becomes the cause of recovery when it reaches the blood." So long as antitoxin is a cellular constituent Ehrlich speaks of it as a cell receptor, because

it is the agency through which the toxin is received into the cell; when cast into the circulation it is a free receptor.

If this conception is correct we have yet to explain the great increase in circulating antitoxin, which characterizes antitoxic immunity. Obviously this result could be accomplished only by excessive proliferation of the cell receptors and their excretion into the blood and lymph streams. Ehrlich assumes that following the injury which toxin exerts on the cell, the latter responds to the injury in a very specific manner. The mere occupation of the receptor by the toxin constitutes an injury or a "cell-defect," and the cell repairs the defect by producing new receptors like that which was bound by the toxin. In the presence of a sufficient amount of toxin, but not an amount so large as to result in the death of the cell new receptors are formed to such an extent that the cell, so to say, is no longer able to contain them, and many escape into the surrounding lymph and blood.

At this point the significance of the term side-chain may be referred to. We are familiar with the so-called benzol-ring or benzol-nucleus in which the six carbon atoms of benzol (C_6H_6) are so linked together that they form a ring. By suitable chemical processes other groups of atoms may be made to unite with one of the carbon atoms. A new group which has been introduced in this way is called a side-chain of the ring, and these side-chains in some instances may be made to take up still other groups of atoms. Ehrlich has conceived that the conditions in the cell are analogous. The receptors of the cell are side-chains which stand in close relationship with some functional center of the cell. When the side-chain (receptor) has united with toxin the impulse which causes the production of new receptors is transmitted to the functional center. The act of manufacturing new side chains (receptors) we cannot divorce from the vital powers of the cell.

The antitoxin receptor is a relatively simple substance, hence Ehrlich calls it a receptor of the first order. We know it only because of its binding power for toxin.

There are, however, other receptors of a more complex structure. The substance in serum which agglutinates bacteria, the agglutinin, is also a receptor which has been overproduced and cast into the circulation in a manner similar to that involved in antitoxin production. Experiments have shown with sufficient clearness that agglutinin is able not only to unite with the corresponding microorganisms, but also to produce in them

some ferment-like change as a consequence of which the cells assemble into clumps. It has then a binding and a ferment-like function; in other words, a haptophorous and an aglutinophorous group. When the latter group degenerates the altered agglutinin is called agglutinoid. Serum precipitins, toxins, and complement have a similar structure, and when their toxic or ferment-like groups are destroyed, they are called precipitoids, toxoids and complementoids. They are receptors of the second order.

It was stated above that the bactericidal power of a serum depends on the combined action of two substances, the amboceptor and the complement. Of the two, complement is a normal constituent of the serum; it is the amboceptor alone which is overproduced in antibacterial immunity. The amboceptor is a receptor of the third order. Its structure is best illustrated by describing the mechanism of bacteriolysis or hemolysis, for the solution of corpuscles by a serum also depends on the action of an amboceptor-complement complex. If a bactericidal serum is heated to 56° C. for thirty minutes the complement, being a labile substance, is destroyed, while the amboceptors are unaffected. If a culture of the corresponding microorganism is now mixed with the amboceptors the latter are absorbed by the bacteria and may be removed with them by a process of centrifugation and washing. The amboceptors have united with the bacteria in a chemical fashion, it is supposed; hence a haptophorous group which has an affinity for some constituent of the organism must be assigned to the amboceptor. Although this union has occurred, suitable culture experiments show that the amboceptors have killed none of the bacteria, hence the amboceptor contains no toxic or ferment-like group. If, however, some fresh normal serum, containing complement, is added to bacteria which have been treated with the amboceptors, the microorganisms are killed. It is necessary to conclude, then, that the complement is the active or ferment-like substance which kills the bacteria.

Now we learn from experiments that complement alone will not kill bacteria, and that it will unite with them chemically only after they have been acted on by the amboceptors. It is the belief of Ehrlich and his followers that complement in uniting with bacteria does so through the agency of the amboceptor. If this is the case, it is necessary to assume that the amboceptor, as the name indicates, contains two binding groups

or haptophores. One of these has already been described as the haptophore which unites with the bacterium—the cytophilous haptophore. The other is the one with which complement unites—the complementophilous haptophore. The amboceptor, like the other receptors, is one which has been liberated from the cells of the body consequent upon a specific bacterial injury. Complement, as stated, is a receptor of the second order, having a haptophore through which it unites with the amboceptor, and a toxophorous group in which its destructive property resides. According to the side-chain theory only those organs with which the bacterial constituents may unite chemically, are able to produce antitoxins, bactericidal amboceptors and other antibodies.

If we speak of the organic origin of the antibodies, it is necessary to consider the essential points of Metchnikoff's phagocytic theory of immunity.

The theory of Metchnikoff when first formulated was concerned only with the ingestion and destruction of bacteria by phagocytic cells. It was Metchnikoff's original conception that phagocytosis of the bacteria accounted for all types of immunity and recovery from infection, and that susceptibility or failure to recover were due to absence of phagocytosis or its impairment. Gradually alterations and amendments to the original premises were necessary in order to render them conformable with newly-discovered facts. When it was found that the pathogenic effects of the bacilli of diphtheria and tetanus were due to soluble toxins, and that the organisms remained to a considerable extent out of range of phagocytic activity, it was necessary to assume, and to furnish experimental proof for the assumption, that the phagocytes were able to absorb and destroy the soluble toxins. When it was found that antibacterial immunity was characterized by the presence of bactericidal amboceptors and complements in the serum, and that the bactericidal power of serum depends on the combined action of these two substances, and when it developed that antitoxic immunity depends on the presence of free antitoxin in the body fluids, amendments to the functions of leucocytes had to be made in order that their dignity as the sole protectors of the body against infections might be maintained. It was necesssary to show that amboceptors, complements, antitoxins and other antibodies have their origin in the leucocytes, that as a result of infection the latter in some manner cause the appearance of

these substances in the plasma, lymph and serum. It is, of course, impossible to cite details, which, in the minds of Metchnikoff and his followers, justify the assumption of the almost exclusive rôle played by the phagocytes in the phenomena of immunity and susceptibility. It will be sufficient to say, by way of summary, that the school of Metchnikoff believes that antitoxin is formed in some way by leucocytic activity and is excreted by the leucocytes into the plasma; that the amboceptors (fixators of Metchnikoff) are formed and excreted in a similar manner by the leucocytes; that complement (cytase of Metchnikoff) is an intraleucocytic ferment under normal conditions and becomes extracellular only after some injury to the leucocytes (phagolysis), such as may occur in infection and in the clotting of blood.

Antitoxin, according to Metchnikoff, is efficient not because it neutralizes toxin chemically, but because it stimulates the leucocytes to an increased absorption and destruction of the toxin. The function of the amboceptors in the living body is to affect the bacteria in some peculiar manner as a consequence of which they are the more readily taken up by the lecocytes and killed by the intraleucocytic cytase. If bacteriolysis occurs in the plasma it is because the leucocytes have been injured by the bacteria or their toxins and have liberated their cytase. In active immunity to bacteria (the result of infection or immunization) the phagocytic power of the leucocytes is said to be increased.

It is not possible at this time to give a detailed comparative analysis of the theories of Ehrlich and Metchnikoff. It may be said, however, that they are not diametrically opposed in many essential respects. The existence and efficacy of the serum antibodies are recognized by both; there are differences of opinion as to their methods of action. Ehrlich does not deny the existence of phagocytosis nor its importance in certain infections; his theory merely is not concerned with phagocytosis. Metchnikoff would have the leucocytes produce all the antibodies; Ehrlich would have antibodies produced only by those cells with which the toxins or bacterial constituents may enter into chemical union, and it is certainly possible, even probable, that the leucocytes may participate in such union in many instances.

The conditions in each disease must be the basis for conclusions as to the cause of the immunity. Unfortunately the conditions in all diseases are not thoroughly known. But in so far as they are known one finds justification in speaking of the three types

mentioned previously: 1, antitoxic immunity, 2, antibacterial or bactericidal immunity, these two being examples of "serum immunity," and 3, phagocytic, or, in a special sense, cellular immunity.

Recent work has shown that even for those diseases in which phagocytosis seems to be of great importance, the serum, or plasma, contains substances which are essential for the phenomenon of phagocytosis. These are the opsonins of Wright and Douglass. If all the serum is removed from leucocytes the bacteria are not ingested. If pure serum is allowed to act on microorganisms for twenty minutes, and the serum is then washed away, the bacteria are englobed by the leucocytes even if all the serum has been removed from the latter also. Hence opsonins affect the bacteria, not the leucocytes, in some peculiar manner, so that they become susceptible to phagocytosis. The work of opsonins is still not far advanced, but the indications are that they will be shown to be of great importance for leucocytic immunity.

Before taking up the principles of therapy with antitoxic and bactericidal serums the meaning of the terms active and passive immunity may be emphasized. Active immunity is caused by infection, vaccination or by repeated injection of an infecting agent, as a consequence of which the tissues undergo a specific reaction resulting in the production of the antibodies which have been described. The long duration of active immunity which is often encountered depends on the fact that the tissue cells continue to produce the antibodies over a long period.

Passive immunity is that which is produced by the injection of antitoxic or other protective serums. The cells of the body are stimulated to no antibacterial or antitoxic action, and the immunity is of rather short duration (two to four weeks) owing to the rapid elimination of the foreign serum. This condition accounts for the short duration of the protection afforded by a prophylactic injection of diphtheria antitoxin.

In speaking of the principles of antitoxic therapy we are concerned with two antitoxins, those of diphtheria and tetanus, a comparative study of which is instructive. If neutralization of toxin by antitoxin consists of chemical union of the two substances, the affinity which exists between the two is important for rapidity and completeness of neutralization. Experiments show that union of diphtheria toxin and antitoxin takes place rather quickly (fifteen or twenty minutes), whereas union between tetanus toxin and antitoxin takes place more slowly

(perhaps in forty minutes). Theoretically such a condition would render tetanus antitoxin less effective in therapy than the antitoxin of diphtheria. Also if toxins injure cells by entering into chemical combination with them, the affinity which may exist between the toxin and cells is of great importance for antitoxic therapy. If the toxin has a greater affinity for the cells than it has for the antitoxin the latter would have all the more difficulty in tearing away the toxin from the cells. For we are to understand that antitoxin cures not merely by neutralizing the toxin which happens to be circulating in the blood, but by tearing from the cells so much of the toxin which has been bound that less than a fatal dose remains in them. Experiments show with sufficient clearness that the affinity of tetanus toxin for the nervous tissue is exceedingly strong; within a very few minutes after the intravenous injection of toxin it is taken up completely by the tissues. Our failure to cure tetanus is clinical evidence of this strong affinity. On the other hand the readiness with which diphtheria under proper conditions may be cured by its antitoxin indicates that the affinity of the toxin for tissue is of a lower order than in the case of tetanus. The nature of the tissue involved in an infection is of importance for the success or failure of antitoxic therapy. In tetanus the most highly organized and the most vital tissue, the nervous system, is involved almost to the exclusion of other organs. In diphtheria, although the nervous system is frequently involved, various organs, the parenchymatous, lymphatic and connective tissues, have an affinity for the toxin and so to say divert it from the nervous tissue. The early administration of antitoxin is universally recognized as a factor of the greatest importance for the cure of diphtheria; antitoxin should be given before a fatal amount of the toxin has become an integral part of the tissue cells. In tetanus it seems that a fatal amount usually is bound before the development of symptoms.

The following, then, are the important factors which influence the success of antitoxic therapy: (1) The degree of affinity which exists between the toxin and its antitoxin; (2) the degree of affinity between the toxin and the cells of the body; (3) the functional importance of the tissues which are involved; (4) the date of administration of the antitoxin in relation to the time of infection, rather than in relation to the onset of symptoms; (5) the administration of sufficiently large doses of antitoxin, for only large doses are able to dissociate the union which has occurred between toxin and cells.

It has not been sufficiently appreciated that tetanus antitoxin has a high prophylactic value in spite of its low curative effect. Its prophylactic power would seem to depend on the thorough distribution of the antitoxin in the body by the time the bacillus has begun to secrete its toxin; it is then in a position to bind the toxin before the latter has opportunity to unite with the nervous tissue. Medical men are familiar with the types of wounds which frequently are followed by tetanus, and failure to give tetanus antitoxin prophylactically in such cases is not justifiable.

When we speak of the principles underlying the therapeutic use of the bactericidal serums, we have little to discuss but their failure as therapeutic agents. The first serious difficulty lies in the lability of complement. Complement degenerates so soon after the animal has been bled that the serum as purchased would be devoid of this most essential substance. Consequently such serums either must be used when absolutely fresh from the animal, or at the time of injection fresh normal serum from a suitable animal must be added, or one must rely on the native complement of the individual for the "activation" of the amboceptors.

There are difficulties connected with each of these measures. In the first place the tissues of the body contain receptors which often have the power of binding the complement which comes from a different animal; this is an experimental fact, and if it occurs in a given instance the complement would be side-tracked from the amboceptors. Then it so happens that there are many kinds of complement, and a particular amboceptor may demand a particular complement for its activation, and the complement demanded in a given instance may be absent from the body fluids of the patient. Furthermore, in infections and in some chronic diseases the complement of an individual undergoes a decrease, consequently though the complement be of the right quality it may be present in insufficient amount for thorough activation of the amboceptors.

A phenomenon known as diversion of complement has been described. If an excess of amboceptors is present, *i.e.*, more than can be taken up by the bacteria, the free amboceptors supposedly have the power of entering into union with some of the complement, and thus diverting the latter from the amboceptors which have united with bacteria. The effect which is produced is that of paucity of complement. Hence it has been suggested

that there is a practical danger in injecting too much of a bactericidal serum.

There is a further danger of theoretical and perhaps practical importance in connection with the use of bactericidal serums. When bacteria are dissolved their endotoxins are set free, and since bactericidal serums dissolve bacteria, they may thereby liberate a dangerous amount of toxic material which they have no power to neutralize. As stated above, bactericidal serums are not appreciably antitoxic.

The localization of the bacteria would seem to be of importance for the success of a bactericidal serum. Pfeiffer believes that the treatment of cholera by anticholera serum offers little hope because of the exclusive location of the living vibrios in the intestinal canal. The conditions are somewhat similar in typhoid fever, although bacteriemia occurs in this instance.

These are considerations which appear to render the low curative value of antibacterial serums more intelligible. In spite of their low curative value, however, they are not without value as prophylactic agents, for the same reason perhaps that tetanus antitoxin is a good prophylactic; that is to say, the amboceptor and complement are on hand at the time of infection and destroy the organisms before the infection is well established.

Vaccination or protective inoculation against some of the bacterial diseases, as typhoid, cholera and plague, has been studied extensively and practised on a rather large scale in the armies of several nations and on the residents of infected districts. One or two injections of killed cultures of the corresponding organisms are given with suitable precautions. The immunity which follows is antibacterial and several days are required for its establishment; it is effective for many months. The process is one of active immunization inasmuch as the tissues are caused to form the antibodies. It has been suggested that mixed active and passive immunization would be an improvement over the simple antibacterial vaccination. The method consists of the simultaneous injection of bacteria and the corresponding antiserum. The passive immunity due to the serum is established at once and remains effective at least until the tissues have had time to establish active immunity. In the presence of an epidemic this method, if it proves successful, would be preferable to simple vaccination.

We find little to say concerning the properties of antiserums which are specific for the organisms of the third group, *i.e.* the

staphylococcus, streptococcus, pneumococcus, etc. Practitioners are familiar with their failure as therapeutic agents. Although it is believed by many that they have a curative value, the correctness of this claim seems not to have been satisfactorily demonstrated. It is at the best very low, and in experimental work it fails altogether unless given simultaneously with or very shortly after the introduction of the microorganisms. Their position as prophylactics is on a somewhat better footing, but they are scarcely out of the experimental stage. The properties upon which their virtues depend are not accurately known. Marmorek claims that his antistreptococcus serum is antitoxic. Other serums are said to be efficient because they stimulate phagocytosis. In view of the recently acquired knowledge concerning opsonins, it seems not improbable that immunization with the organisms mentioned may cause a specific increase in suitable opsonins and that a higher phagocytic power on the part of the immunized animal is thereby established. Opsonins like complement seem to be very labial substances, hence their efficiency may be compromised for practical purposes much as that of complement is compromised. However, there is yet much to learn concerning opsonins.

In conclusion I trust that the hope which I entertained of pointing out certain principles of immunity, especially acquired immunity, has not altogether failed. It is, of course, appreciated that what we are willing to call principles to-day may in some instances be altered or set aside subsequently in conformity with a better understanding of the conditions.

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THE BACTERIOLOGY OF THE PUERPERAL UTERUS.

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AT the present time the bacterial origin of puerperal fever is universally admitted, and practically all investigators believe that the great majority of fatal infections are due to the introduction of the bacteria from without; but at the same time many obstetricians still appear unwilling to accept the responsibility which attaches to such a view, and have at-

tempted to justify their attitude by the study of the bacterial contents of the vaginal secretion and uterine lochia. Thus, if the febrile condition is due to the introduction of bacteria from without, it seems natural to assume that the uterus in afebrile cases should be free from bacteria, or at least from pathogenic varieties. If, on the other hand, the uterus contains such bacteria in patients presenting a normal puerperium, one would be obliged to admit that there was a possibility that these organisms might be the etiological factors concerned in febrile cases, and that the introduction of bacteria from without was not necessary for their causation.

Döderlein and the investigators immediately following him showed that the normal puerperal uterus was almost universally sterile, and, even when it did contain bacteria, that streptococci were never present. Gradually, however, a number of investigations have been reported, which tend to cast doubt upon such a view; while the recent contribution of Stolz apparently indicates that the puerperal uterus not infrequently contains streptococci, and that other bacteria are present in a large proportion of cases.

I have undertaken the following investigation concerning the bacterial contents of the puerperal uterus for the purpose of confirming or disproving Stolz's conclusions; but before proceeding to the consideration of my own findings, I shall give a short résumé of the work previously done upon the subject, and shall attempt, as far as possible, to reconcile the conflicting conclusions of the various authors.

The first contribution to the subject was made in 1865, by Mayrhofer, who examined the uterine lochia, which he obtained by making suction through a glass tube. When the puerperium was febrile he was invariably able to demonstrate the presence of cocci and bacilli; while in afebrile cases bacteria were not found, although examinations were made upon the 2d, 3d and 4th days of the puerperium. He believed that bacteria were usually present in the blood of febrile patients, but was unable to demonstrate their presence, though he obtained positive results with the pleural and peritoneal exudate.

Karewski, likewise, conducted a series of investigations by introducing into experimental animals the lochia from febrile and normal patients. He found that dogs were apparently immune to their action, while rabbits were particularly susceptible and invariably died, though death occurred much

sooner when abnormal lochia were employed. In guinea pigs the injection of lochia from febrile cases was uniformly fatal, while those from normal puerperal women were without appreciable effect. He also mentioned similar experiments performed by Scherer in 1843, and Rokitansky in 1873, and stated that the former found that the injection into the peritoneal cavity of rabbits of lochia obtained on the 3d day of the puerperium led to death in all cases, while Rokitansky's results were much less definite.

In 1887 Doderlein published the results of the examination of the lochia obtained on various days of the puerperium in 30 patients, in none of whom the temperature at any time exceeded 38° C. In 27 cases the uterus was absolutely sterile, while in 3 bacteria were present; only in one instance could streptococci be demonstrated. At the same time, he found the staphylococcus aureus in the vagina of a febrile patient, who had not been examined internally. As the result of his investigations he drew the following conclusions:—1. That under normal conditions the uterine lochia do not contain bacteria; 2. that bacteria are almost universally present in cases of severe puerperal infection; and 3. that bacteria may occasionally be introduced into the generative tract otherwise than by the hands or instruments of the obstetrician, and suggested that they might come from the rectum, or be introduced during sexual intercourse.

The following year (1888) von Ott and Czerniewski arrived at similar conclusions from the study of the lochia of normal puerperal patients. The former examined 9 and the latter 57 cases, and obtained negative results in 9 and 56 instances, respectively. Czerniewski, likewise, examined the lochia from 53 patients with slight fever and found streptococci in 49 instances (93 per cent.). As, however, the streptococcus was present in one of the afebrile cases, he inferred that this organism, although usually associated with fever, might nevertheless be present without giving rise to symptoms.

Thomen, in 1889, studied the lochia from nine patients, between the second and fifth days of the puerperium, and found that they were sterile in six instances. In the other three, gonococci were isolated once and streptococci twice. His technique was crude, as he considered that he had to deal with a contamination whenever less than 10 colonies were present upon the plates.

This work was followed by the important contribution of Bumm, who contended that by far the greater number of cases of infection were due to typical external infection, though occasionally this could not be demonstrated. Nevertheless, he held that such cases should not be considered as affording proof of the possibility of auto-infection or infection by bacteria normally present in the vagina, as the latter did not contain streptococci in normal women. On the other hand, he demonstrated the presence of streptococci in 8 out of 11 cases of fever, which, from their benign clinical course, had been ascribed to saprophytic infection.

Further study of the bacterial contents of the vaginal secretion did not entirely substantiate Bumm's claims, for Williams, Döderlein and Burckhardt were able to cultivate pathogenic organisms from the vaginal secretion of healthy women in a varying percentage of their cases. Without, however, going into the details of this much-discussed question, it may be said that the latter results are now believed to have been due to faulty technique, as was demonstrated by the work of Krönig and Menge, and a second series of observations by Williams.

In 1893 von Franque reported finding bacteria in the lochia from two of ten women presenting a normal puerperium. In one instance the organism was undoubtedly the streptococcus, while in the other it was probably the gonococcus. This communication is also of importance, as it contains the first mention of bacillus coli as an infectious agent in the puerperium.

Walthard (1895) demonstrated the presence of streptococci in the vaginal secretion in 27 per cent. of his cases, but found the uterine lochia sterile in ten cases, which had not been examined during labor. On the other hand, in ten cases which were examined, the lochia were sterile only in three, and he therefore concluded that the positive results in his second series of cases were due to the introduction of the bacteria by the examining finger. He considered that the spontaneous immigration of the bacteria was practically impossible, and that any slight danger from that source was counteracted by the douching action of the liquor amnii and the bactericidal properties of the uterine lochia. He held, however, that these considerations did not apply to the gonococcus, as it could exist for years in the cervical canal and be transported to the uterine cavity by means of leucocytes. Moreover, he insisted that the bacterial contents of the generative tract varied with

the portion examined, and believed that normally bacteria were not present above a certain zone in the cervical canal, which varied with the degree of laceration of the cervix; while below this limit they were always present in large numbers.

Up to this time there had been a certain, if slight, uniformity in the results obtained, but in 1898 Burckhardt reported that the lochia showed the presence of bacteria in cultures and smears in 11 out of 14 patients examined on the eleventh and twelfth days of the puerperium, and in the smears from two of the remaining cases. On the other hand, Krönig and Menge obtained positive results in but 13 out of 63 cases, streptococci being noted three times, while in 6 of the remaining 10 cases, bacteria were present only in the smears.

The question was still further complicated by the contribution of Stähler-Winkler (1899), who obtained positive results in 16 out of 19 puerperal cases. These results were so surprising that he suspected some fault in his technique, and upon examining a second series of cases with greater precautions, and making both aërobic and anaërobic inoculations, he obtained positive results in but 20 out of 55 patients. Streptococci were never present, and in six instances the bacteria cultivated were obligate anaërobes.

The following year (1900) Döderlein and Winternitz reported the examination of the lochia from 250 puerperal cases, with positive results in but 43. Streptococci were demonstrated in five instances, while in 25 others the bacteria were obligate anaërobes. It should be noted, however, that these investigators assume that cases showing gonococci in pure cultures should be regarded as negative.

The same year Franz published a contribution which was based upon the examination of 50 febrile and 10 afebrile cases. Though positive results were obtained in practically every instance, it is significant that streptococci were present only in the lochia from the febrile cases. Streptococci were isolated in one afebrile case, but in the remaining 9 the bacteria were "saprophytes."

The investigation of Vogel added still further to the confusion in the matter and tended to show that the bacterial contents of the uterus increased as the patient advanced in the puerperium. Thus, of 15 cases examined on the fourth and fifth days, twelve were negative, as compared with five in a

similar series observed later in the puerperium. Streptococci were noted once in the first and twice in the second series.

Wormser obtained similar results from the study of a series of cases on the eleventh day of the puerperium and found bacteria present in 84 out of 100 cases. In one-third of these, however, the plate cultures were sterile.

Schauenstein attempted to reconcile the contradiction between the results of Döderlein and Wormser, who, it will be remembered, obtained negative results in 83 and 16 per cent. of their cases, respectively. He attributed the difference in great part to the lack of uniformity in the manner in which the secretion was inoculated from the Döderlein tube; since when small amounts were inoculated, negative results were frequently obtained, while with large amounts the reverse held good. Thus, in 100 cases which he examined, using large amounts of secretion, bacteria were demonstrated in 64, and nearly one-half of these were streptococci.

Shortly after this, and from the same clinic (Graz) appeared the more pretentious work of Stolz, which has received wide attention. He obtained positive results in 80.4 and 35 per cent. of his cases, according as they were examined on the fourth or ninth days of the puerperium, and found streptococci in 11 and 36.9 per cent. of the positive cases on those days respectively.

Thus far the only contributions to the subject from England and America are those of Foulerton and Bonney, and Marx. The former found the lochia invariably sterile in 12 instances which were examined at varying periods from the third to the tenth day of the puerperium, while the latter obtained but two positive results in 47 examinations.

Upon analyzing the work which has thus far appeared it may readily be divided into two groups according as it tends to confirm or disprove the assertion of Döderlein that the uterine lochia are normally sterile. The following table gives the results which tend to confirm his contention:

von Ott in 9 cases found the lochia sterile in 100 per cent.

Czerniewski in 57 cases found the lochia sterile in 98 per cent.

Döderlein in 30 cases found the lochia sterile in 90 per cent.

Döderlein and Winternitz in 250 cases found the lochia sterile in 83 per cent.

Vogel in 15 cases found the lochia sterile in 80 per cent.

V. Franqué in 10 cases found the lochia sterile in 80 per cent.

Krönig and Menge in 63 cases found the lochia sterile in 79 per cent.

Thomen in 9 cases found the lochia sterile in 66 per cent.

Walthard in 20 cases found the lochia sterile in 65 per cent.

Stähler-Winkler in 55 cases found the lochia sterile in 64 per cent.

On the other hand, a second table gives the results of Döderlein's opponents.

Franz in 10 cases found the lochia sterile in 0 per cent.

Burckhardt in 14 cases found the lochia sterile in 7 per cent.

Stähler-Winkler in 19 cases found the lochia sterile in 16 per cent.

Wormser in 100 cases found the lochia sterile in 16 per cent.

Stolz, fourth day, found the lochia sterile in 19.6 per cent.

Vogel in 15 cases found the lochia sterile in 34 per cent.

Schauenstein in 100 cases found the lochia sterile in 36 per cent.

Stolz, ninth day, found the lochia sterile in 65 per cent.

After considering the matter thoroughly, it would seem that these very striking variations in results might be susceptible to one or the other of several explanations: Examination of the patients at different periods of the puerperium; 2. Variations in technique; and 3. Variations in classification.

These factors are so interdependent upon one another that it is difficult to consider them separately; but a few of the more salient features may be noted in connection with each. Thus, with one or two minor exceptions, the investigators who agree with Döderlein have based their results upon the examination of lochia obtained prior to the eighth day of the puerperium, and those holding opposite views, on or after the tenth day; Stolz, who found 80.4 per cent. of positive results on the fourth day, being the single marked exception in this regard. Moreover, it is interesting to note that he has apparently made an error in calculating his results, as it would appear that the above percentage does not tally with the other statements made by him. Thus, on page 150 of his monograph, he distinctly states that he examined the lochia of 75 cases on the fourth day, of

which 46 were afebrile, and then goes on to say that 27 of the latter were sterile; that is, he found the uterine cavity sterile in $\frac{27}{46}$ths of his afebrile cases—58.77 per cent. instead of 19.6 per cent., as he states in his conclusions. It would, therefore, seem that he obtained the latter figure by incorporating into his argument the results obtained from the examination of the vaginal lochia, which naturally has only a very indirect bearing upon the point at issue.

Moreover, the other investigators who made their observations during the late puerperium have apparently lost sight of two important considerations. In the first place, since the object of their investigations is to determine the possibility of auto-infection during the puerperium, the demonstration of organisms on or after the tenth day, a time when infection is extremely infrequent, can have no positive bearing upon the question at issue. In the second place, examinations made at that period involve an important question of technique. Thus, in order to obtain a considerable amount of uncontaminated lochia on or after the tenth day, it is necessary for the secretion to be fairly abundant, and what is much more important, for the cervix to be sufficiently patulous to permit the ready introduction through it of a tube at least 5 mm. in diameter; for if its passage be obstructed, it will be impossible to prevent the cervical secretion from entering the tube unless it be provided with a replaceable cap, in which event any contamination present at the point of obstruction will be pushed up into the uterine cavity in front of the tube. It would, therefore, appear that it becomes increasingly more difficult to obtain uncontaminated lochia in the latter part of the puerperium. This contention is borne out by the results of Schauenstein, who noted that there was a difference of 20 per cent. in his results accordiug to the portion of the tube from which the lochia was taken for inoculation, as many more bacteria were found in that part which first entered the uterus. On the other hand, Opitz, who examined autopsy specimens and made his cultures only after laying open the cavity of the uterus, obtained negative results in nine out of ten instances.

Anyone familiar with the work done upon the bacteriology of the vagina will realize the importance of observing the most careful technique, and this subject may be considered under several headings; viz.: preparation of the patient, method of obtaining the lochia for examination, method of inoculation, culture media, and the interpretation of the results.

In the majority of the investigations just mentioned the preparation of the patient consisted in swabbing the vulva with bichloride followed by the disinfection of the vagina and the vaginal portion of the cervix. It is true that some of the investigators, notably Döderlein, Schauenstein, Wormser and Stolz, have omitted vaginal douches, and Wormser considered that scrupulous cleansing of the external genitalia was quite unnecessary in experimental work. In my estimation, however, the importance of this feature cannot be overestimated, obtained by different investigators in the study of the bacteria as upon it alone depended, as demonstrated by the work of Williams, the wide variations in the results obtained by different investigators in the study of the bacteria contained in the vaginal secretion.

Nearly all who have worked upon the subject agree that the tube introduced by Döderlein offers the most satisfactory method of obtaining the uterine lochia for examination; and Burckhardt, Franz and Stolz have attempted to lessen the possibility of cervical contamination by introducing the tube through a small cervical speculum, and by covering its uterine end with a small cap. I consider, however, that these supposed improvements are open to objection, and that the employment of an aspirator, which is particularly necessary in the latter part of the puerperium, still further complicates the techinque.

As far as the interpretation of the results is concerned, it would seem obvious that they must be either positive or negative, but it remained for Wormser and Schauenstein to stipulate that this question should be decided, not upon the presence or absence of bacteria, but rather upon the number and distribution of the colonies obtained. A still further complication has arisen concerning the relative value of interpretation, based upon smear preparations and the cultivation of bacteria upon media. With a careful technique, the presence of well developed bacteria in smear preparations made from the middle portion of the tube, undoubtedly calls for a positive diagnosis; but, on the other hand, this is not necessarily the case when a growth has been obtained in a fluid medium, while the smear preparations are negative; and the results are particularly doubtful when the organisms thus obtained cannot be identified with certainty. While fluid media may be better adapted to the cultivation of certain bacteria, no one can deny that the possibilities for contam-

ination are necessarily greater with them than with solid media. Moreover, since practically all organisms concerned in the production of puerperal infection can be grown upon solid media, it would seem that the use of fluid media should be discouraged, as the employment of plate cultures would tend to much greater accuracy, and that the arguments urged against their use are in great part ill founded.

Associated with the question of culture media is that of anaërobic cultures, which have been made use of by all observers, since Franz showed their value in 1900. In all cases they have been made according to Liborius, which naturally precludes the use of fluid media.

The number of tubes of media inoculated is also of importance, for where fluid media are employed, the necessity for control is obvious. Accordingly, it would seem that Döderlein, who inoculated 21 tubes, in each instance, is more likely to have obtained accurate results than Schauenstein, who employed but four.

Two methods of inoculation have been employed. First, the direct transfer of the lochia from the tube to the culture media by means of the platinum top; and secondly, by an indirect method, in which the contents of the tube are blown into a supposedly sterile dish, mixed with supposedly sterile water, after which the mixture is transferred to the media. It seems hardly necessary to indicate that the latter method, which was employed by Schauenstein, Wormser and Franz, offers abundant opportunity for contamination, and that much more satisfactory results would have been obtained by inoculating directly with the entire contents of the Döderlein tube.

Strange to say, the apparently simple matter of dividing cases into normal and abnormal or febrile and afebrile, offers perhaps a greater opportunity for variation than either the time of examination or the technique employed, as is readily understood after reading the numerous contributions of Ahlfeld.

Döderlein classified as normal all cases in which the rectal temperature measured bi-daily did not reach 38.5 C., while Wormser suggested 38 C. by the axilla, and Braun v. Fernwald placed the limit at an axillary temperature of 37.6° C. Sarwey and Wormser have directed attention to several of the inaccuracies of the axillary method. Wormser has likewise shown that even with the most careful technique, bi-daily

axillary readings gave the actual maximum temperature in only 46.2 per cent. of his cases, though the afternoon reading and the highest temperature of the day rarely differed by as much as 0.5 C. The importance of such variations can be realized when one recalls the statement of Ahlfeld, that a variation in the maximum temperature of 0.2° C. would serve to decrease his morbidity by one-half.

Matthey has estimated that the average difference between the vaginal and axillary temperatures is about 0.51° C. Thus, it would seem that the limit of Döderlein—38.5 rectal, or 38° C. axillary—if based only upon bi-daily examinations, would enable one to classify as normal many cases which would really be abnormal had the temperature been taken more frequently.

With the foregoing considerations in mind, it would seem most important: 1. To differentiate more accurately between normal and abnormal cases; 2. to develop a simple and absolutely accurate technique; and 3. to give particular consideration to the practical side of the question at issue, namely, its bearing upon the causation of puerperal infection.

It has been the custom in the Obstetrical Department of the Johns Hopkins Hospital to classify as normal all cases in which the maximum mouth temperature does not reach 100.6 F. (38.1 C.) at any time during the first ten days after delivery. With this relatively high limit one might expect that the percentage of morbidity would be low, which would undoubtedly be the case, but for the fact that readings are taken every four hours for the first ten days of the puerperium, and every two hours if the temperature at any time reaches 100° F. (37.7 C.) This is clearly indicated upon comparing the results obtained in two series, consisting of the last 500 cases delivered in the hospital, and an equal number in the Outpatient Department, respectively. In the former, where the temperature was measured every four hours the morbidity was 3.2 per cent., as compared with 13 per cent. in the latter series, where the temperature was taken daily, but at irregular intervals.

In order to compare our results with those of Döderlein, who placed his limit at 38.5 per rectum, we have made bi-daily rectal measurements in several hundred consecutive cases, in addition to those usually made by the mouth. In a series of 50 of these cases it was found that the average maximum rectal reading exceeded that by the mouth by 0.4° F., or 0.2° C. In this series of 50 cases, the mouth temperature

reached 38.1 C. (100.6 F.) in 9, as compared with 17 instances where measured by the rectum, a morbidity of 18 and 34 per cent. respectively; while a rectal temperature of 38.5 was noted in only 6 cases—12 per cent. It is therefore obvious that when the limit is placed at 38.5 rectal, a large number of cases escape being classified as abnormal.

The technique employed in obtaining the lochia in my investigations has been that of Döderlein and Schauenstein, but modified in two important particulars. In the first place, the patient is prepared by cleansing most carefully the external genitalia; and in the second place, the lochia are obtained by means of a Döderlein tube, so modified as to reduce to a minimum the possibility of contamination. Covering the parts adjacent to the field of operation with sterile dressings, the careful sterilization of instruments, and the use of rubber gloves have still further lessened the possibility of contamination. Believing that it has been demonstrated that the vagina does not normally contain pathogenic organisms, douches were not given prior to removing the sample of lochia, but in each instance after obtaining a good exposure of the cervix, the external os was carefully sponged dry with sterile gauze.

The modification of the Döderlein tube was described by me in the Johns Hopkins Hospital *Bulletin* (1904, Vol. XV, p. 250), and consists in introducing into the distal end of the tube a rubber plug, improvised from a folded rubber band, which not only prevents the possible entry of cervical secretions while the tube is being introduced, but which, by a draw-string attachment, is converted into an aspirator when one is ready to obtain the lochia. After the lochia have been drawn into the tube, it is removed from the uterus, sealed with wax and wrapped in a sterile covering for transportation to the laboratory. There, with every possible precaution, direct inoculations, with as large a quantity of lochia as possible, were made upon the following media for aërobic cultures:

Agar agar for plates	3 tubes.
" " slant	1 "
Glucose agar slant	1 "
Hydrocele agar slant	2 "
Blood serum slant	1 "
Litmus milk, bouillon and glucose bouillon	1 tube each.

The following were inoculated for incubation in an atmosphere of hydrogen:

Glucose agar	2 tubes
" bouillon	1 "
Blood serum	1 "
Glucose milk	1 "

Owing to the climatic condition in Baltimore, gelatine did not prove a suitable medium, and, therefore, was but little used.

All the media were prepared according to the formulæ in use in the Bacteriological Department of the Johns Hopkins University, which are practically identical with those employed elsewhere.

The agar agar employed in making plate cultures contained 2 per cent. of glycerine, so as to afford a more suitable medium for the cultivation of streptococci, but only twice in my entire series of observations did a growth of any kind occur upon the plates, streptococci in one and B. coli in another instance. In the single case in which streptococci were present, they were demonstrated just as readily upon the plates as in the fluid media, a finding quite in accord with our observations upon the lochia in definitely febrile cases.

In each instance smears were made from the material at both ends of the tube as well as from its middle portion. The entire amount of lochia obtained was then divided among the various tubes of media, as nearly as possible in equal quantities, except that an amount corresponding with .3 to 4 cm. of the length of the tube was inoculated in the bouillon tube for aërobic incubation. The smears taken directly from the lochia were invariably examined, as well as those from each tube after two days incubation if a growth were present, and after five or seven days if it appeared to be sterile. Every case in which bacteria were present, either in the smears or in the cultures, has been classified as positive.

As it was desirable not only to determine whether bacteria were present in the normal puerperal uterus, but also, assuming their occasional presence, to discover if possible, when and in what way they gained access thereto, three samples of lochia were taken for examination from each of our fifty cases. The specimens of lochia were obtained immediately after labor,

and upon the third and seventh days of the puerperium. These times were chosen with a practical object in view. It is customary in the Obstetrical Department of the Johns Hopkins Hospital to take uterine cultures at the completion of labor in all cases which have been subjected to attempts at delivery outside the hospital; and when, as is not infrequently the case, the presence of organisms can be demonstrated and fever subsequently develops, we do not consider ourselves in any way responsible for the infection. On the other hand, if it should be shown that organisms are normally present at the completion of labor, such an attitude would be quite unjustifiable. The choice of the third day for making the second examination was suggested by the frequency with which infections manifest themselves at or about that period of the puerperium; while the fact that gonorrheal infections develop more slowly indicated an examination on the seventh day.

Of the 50 patients studied, 40 were classed as normal, since the maximum temperature at no time in the puerperium reached or exceeded 100.6 (38.1 C.). A single exception was made in this regard; namely, a patient whose temperature immediately after the completion of labor was 100.8°, but which at no other time reached even 99.5° (37.5° C.). It is not to be assumed, however, that the remaining 10 cases differed markedly in their clinical features from those classed as normal; indeed, the rises above the limit of 100.6 were frequently noted only once, and in some instances could be attributed to conditions quite apart from the puerperal state.

CULTURES AFTER THE COMPLETION OF LABOR.

In considering these results, it seemed that no practical object could be gained by grouping the cases according as they were normal or febrile later in the puerperium.

Organisms were demonstrated in four of the fifty cases; that is, the results were negative in 92 per cent. Analysis of the four cases in which bacteria were present shows that this figure is below the limit of absolute accuracy. Thus, in two instances, both smears and cultures were positive, while in the third case bacteria were present only in the smears, and in the fourth only in cultures. The gonococcus was present twice. Once, it was seen in the smears only, at this time, but was cultivated from the lochia on the seventh day. In the second case, an

imperfect Döderlein tube broke in the cervical canal and gonococci were grown from the secretion obtained. They were not present in the uterus of this patient on the third day, but were demonstrated both in smears and cultures on the seventh day.

Lochia from a patient with a complete tear of the perineum showed bacillus coli, possibly a contamination at the time the culture was obtained, as neither this nor the two (gonorrheal) cases previously considered were examined vaginally during labor. The remaining case, in which one or two colonies were obtained in anaërobic glucose agar, was likewise positive on the third and seventh days, though on each occasion only a few colonies were grown. The organism was a gram staining diplococcus, which could not be grown or transferred.

It is interesting to note, that only one of these cases in which organisms were demonstrated after labor, developed fever in the puerperium, and that was the one in which gonococci were found in the smears, but not in the cultures. The fact that the presence of B. coli in the lochia had no effect on the normal character of the puerperium, is also worthy of mention, and would seem to suggest the question whether that organism, alone, is an important factor in the production of infection.

It may be concluded from this first series:

I. The uterine lochia immediately after the completion of labor rarely contained bacteria, and were sterile in 92 per cent. of our cases, or in 96 per cent. if the gonorrheal cases be included.

II. Bacteria may be present in the lochia at the completion of labor even when the patient has not been examined vaginally, and in such exceptional cases, the puerperium may be normal.

III. The bactericidal power of the normal blood serum may be accountable for a certain number of the negative results. In ten of the fifty cases examined, operative procedures necessitated the introduction of the entire hand into the uterine cavity, and as no preliminary vaginal douches were employed, it is impossible to believe that certain vaginal bacteria were not carried up into the uterus. The douching action of the liquor amnii, the fact that all manipulations would be conducted within the amniotic cavity, and the frequent flow of blood after expression of the placenta, may help to explain the absence of these organisms from the cultures.

CULTURES ON THE THIRD DAY POST-PARTUM.

Fifteen of forty afebrile cases showed organisms in the lochia on the third day, while 62.5 per cent. were absolutely sterile. Five of the fifteen were positive both in the smears and in the cultures and the same number in the smears alone and in the cultures alone, respectively. The gonococcus was again an important factor in the production of the positive results, for all five cases in which organisms were seen in the smears, but could not be grown in cultures, gave positive results in smears or cultures at a later examination. The child of one of these patients developed gonorrheal ophthalmia; while a clinical diagnosis was suggested in another instance by an excessive vaginal discharge during pregnancy, and subinvolution of the uterus after delivery.

Likewise, in the five cases in which the smears were negative and the cultures positive, gonococci were found twice; and in both these cases positive results were obtained in both smears and cultures on the seventh day. In the other three cases scattered colonies of an anaërobic micrococcus, M. cereus flavus, and a variety of B. dysenteriæ were found, respectively.

Finally, in the five cases in which both smears and cultures were positive, the gonococcus was demonstrated three times, and B. coli and an anaërobic diplococcus, respectively, in the other two.

These results may be summarized as follows:

Smears negative and cultures negative, 25. Smears negative and cultures positive, 5, gonococci, 2. Smears positive and cultures negative, 5, gonococci, 5. Smears positive and cultures positive, 5, gonococci, 3.

Cultures from the ten febrile cases were negative four times, 40 per cent. as compared with 62.5 per cent. in the afebrile series. The gonococcus was accountable for one positive result, for although present only in smear preparations, as was also the case at the time of labor, it was grown on the hydrocele medium on the seventh day. Counting this case as negative, *positive* results were obtained in 50 per cent. as compared with 15 per cent. in the afebrile cases.

The following organisms were present in three cases, respectively: An anaërobic bacillus, a foul-smelling gas producing bacillus, and a diplococcus, negative to Gram's stain and growing only in milk. None of these bacteria could be identified with

certainty, but as the first two reappeared in the cultures on the seventh day, it does not seem probable that they were contaminations. In the two remaining cases, the B. ærogenes capsalatus was isolated once alone and once in association with the streptococcus. Both these cases have been reported elsewhere. In the first, the clinical diagnosis of a hematogenous infection during typhoid was borne out by the autopsy, at which organisms were demonstrated in all the tissues; while in the second, the streptococcus was probably the true infecting agent, and the growth of B. ærogenes was due to a lochia metra. This last was the single instance in which streptocci were present in any of the fifty cases at any time. The organisms grew readily, not only on the agar plates, but on the slants and in the fluid media.

Comparing the results of the third with those of the first day, it is noteworthy that one of the cases which was positive immediately after labor was negative on the third day, this being the case in which we obtained cervical secretion owing to a flaw in the lochial tube.

The results obtained on the third day show:

I. That the puerperal uterus was absolutely sterile in 62.5 per cent. of 40 afebrile cases, as compared with 40 per cent. in ten cases in which the temperature reached 100.6° or higher.

II. That the inclusion of the cases in which gonococci were demonstrated will increase these percentages to 85 per cent. and 50 per cent. respectively.

III. That the inclusion in the febrile series of certain cases in which the rise in temperature was obviously not due to any intrauterine condition, and in which the lochia was sterile, has served to decrease the percentage of negative results in the afebrile series and of positive results in the febrile series.

IV. That the finding of bacteria in the cervical canal at the completion of labor does not argue their presence in the uterus later in the puerperium.

V. That gonococci may be demonstrated in the leucocytes of the lochia on the third day and still be incapable of growth on the usual media, but that on the other hand, they may occasionally be demonstrated in cultures when not noted in smear preparations.

CULTURES ON THE SEVENTH DAY.

Examination of the lochia on the seventh day gave positive results in five instances where previous cultures from the same

uteri had been alsolutely sterile. From three cases a diplococcus was obtained, that is, it was seen in the smear preparations when stained by Gram's method, and in two of these cases a slight growth was obtained; once in milk with slight acidity and again in glucose agar with slight gas production. Transfers were invariably negative. This organism was similar to, if not identical with, the diplococcoid forms so frequently observed in the vagina and cervix, and it is not impossible that its presence may be due to the fact that the cervical canal frequently offered considerable resistance to the introduction of the culture tube, thus making an absolutely reliable technique almost an impossibility. In the two remaining cases, gonococci were present, and in each instance the cultures supplemented a clinical diagnosis.

It is noteworthy that from twenty lochia showing bacteria at this time in the puerperium, gonococci were isolated twelve times; in eight instances in pure culture, twice associated with diplococci which retained Gram's stain, and twice with other bacteria. It is quite possible that two of these last may have been pure cultures of the gonococcus, as failure to decolorize with Gram's stain has been noted by numerous observers when smears are made from pure cultures of that organism.

Anaërobic microorganisms were noted twice, and in each instance had been present on the third day as well. Bacillus coli was present, as before, in the lochia of the patient with the complete tear, though this time the colonies were very few in number. Another culture showed fairly abundant growth of an organism identified as B. pseudo-diphtheriæ; but no reason for its presence could be discovered. In the cultures made on the third day it was noted that B. pseudo-dysenteriæ had been seen in cultures though not present in the smears; on the seventh day, however, the cultures were negative, but the smears showed great numbers of leucocytes in which many bacteria could be seen.

Only two of the ten febrile cases had sterile lochia on the seventh day. Gonococci and anaërobic bacilli were each present in three instances; while in the remaining two cases, a diplococcus, possibly the gonococcus, and a combination of bacteria were found, respectively. It is noteworthy that the streptococcus present on the third day had disappeared on the seventh day.

The following conclusions can be drawn from this series of cultures:

I. That the uterine lochia on the seventh day were sterile in 50 per cent. of the afebrile cases, as compared with 20 per cent. in the febrile.

II. That the inclusion of these cases in which gonococci were demonstrated would increase these figures to at least 70 per cent. (possibly 80 per cent.) and 50 per cent. respectively.

III. That the bacteriological findings, according as the case is febrile or afebrile, differ more markedly than the clinical characteristics of the cases.

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TABLE I.—AFEBRILE SERIES.

Afebrile	Cases	Per-centage	Gono-cocci	Negative	Other Positive
Total	120				
Smears and cultures, negative	82	68.3		68.3	
Smears, positive; cultures, negative	9	7.5			
Gonococci			5.83		
Other intracellular diplococci					.84
" " bacilli					.83
Smears, negative; cultures, positive	9	7.5			
Anaërobic micrococci					2.5
Gonococcus			1.67		
" and M. Albus					.83
M. Cereus flavus					.83
B. Dysenteriæ					.84
B. Coli					.83
Smears and cultures positive	20	16.7			
Gonococci			7.5		
" and bacilli					3.34
" and other cocci					
Micrococci aërobic					1.67
" anaërobic					1.66
B. Coli					1.67
B. Pseudo-diphtheriæ					.83
Total	120	100	15.	68.3	16.7
			83.3		16.7

TABLE II.—FEBRILE SERIES.

Febrile	Cases	Per-centage	Gono-cocci	Negative	Positive
Total,	30				
Smears and cultures, negative	15	50		50	
Smears, positive; cultures, negative	3	10			
Diplococci (gonococci)			3.3		
Micrococci					6.7
Smears, negative; cultures, positive	1	3.3			
Anaërobic micrococci					3.3
Smears and cultures, positive	11	36.7			
Gonococci			10		
Micrococci					6.7
Streptococci and bacilli					3.3
Anaërobic bacilli					13.3
B. Subtilis					3.4
Total	30	100	13.3	50	36.7
			63.3		

IV. That there is evidence of self-cleansing of the uterus, and that, the presence of bacteria on any one day in the puerperium, does not argue their continued presence; and that Stolz' finding fewer bacteria late in the puerperium is explicable on these grounds.

Tables I and II give summaries of the results of all these examinations of both afebrile and febrile cases. It will be seen that the uterine lochia were absolutely sterile in 68.3 per cent. of the 120 examinations. The addition of the cases which contained gonococci (15 per cent.) brings this figure to 83.3 per cent., a result strikingly similar to that obtained by Döderlein and Winternitz. It is also remarkable that the cases with but slight fever—for in only two of the abnormal puerpera were there clinical signs of disorder apart from the rise in temperature—showed bacteria in one-half the specimens of lochia examined. This fact may be interpreted in two ways. First, that all rises in temperature during the puerperium are not associated with the puerperal infection, and second, that even slight fever in the puerperium markedly increases the probability of bacteria being present in the lochia.

The finding of bacteria at times only in the smears and at others only in the cultures, seems explicable by the contamination of the obtained secretion; for it will be seen that eight of twelve lochia, from which gonococci were later obtained in culture, showed the same organism previously in the smear preparations. As these smear preparations were made from the secretion at the extreme end of the lochial tube, it is probable that they contained part of any cervical secretion which may have been carried up by the tube. On the other hand, the organisms grown in cultures from lochia which had shown no organisms in the smears, are those that might reasonably be expected to enter the uterus with the slightest fault in technique.

One fact must stand out prominently; namely, that "under normal conditions the puerperal uterus contains no pathogenic bacteria."

Considerable prominence has been given to the finding of gonococci in about 15 per cent. of all the cases examined, or about 20–30 per cent. of the cases examined on the seventh day. There can be no doubt of the propriety of Döderlein's contention that the finding of this organism alone has no special significance in connection with the question of auto-infection, and that in experimental work such cases should be classified as negative.

Foulerton and Bonney had little success in isolating the gonococcus, but this was undoubtedly due to the small amount of secretion obtained. On the other hand, our own results bear out those of Krönig, and with one or two exceptions have been based on the cultural characteristics of the organism in addition to its typical appearance in smear preparations. Questionable diagnoses from smear preparations on the first and third days have almost invariably been confirmed by cultures on the seventh day. As a rule, cultures were obtained only upon hydrocele agar; though occasionally a few colonies developed when a large quantity of lochia was implanted on ordinary agar or blood serum. In such cases, however, transfers grew only upon hydrocele agar.

In many instances the presence of the gonococcus could be predicted from the macroscopic appearance of the lochia, which possessed the thick-glairy-blood-tinged-mucus character noted by Taussig, as present in puerperal fever due to this organism.

It is probable that the passage of the gonococci into the puerperal uterus is very gradual. This is clearly shown by Table III, from which it is seen that they were demonstrated in 2.5, 25, and 30 per cent. of the cases, respectively, on the first, third and seventh days. At the same time these figures do not give an accurate idea of the frequency with which gonococci were obtained in cultures, as they were cultivated iu 12.5 and 25 per cent. on the third and seventh days, respectively; while they were found in the smears alone, and in both smears and cultures with equal frequency on the third day, but in a proportion of 5 per cent. to 22.5 per cent. on the seventh day.

EFFECT OF LACERATION OF THE PERINEUM AND CERVIX ON THE BACTERIAL CONTENT OF THE UTERUS.

Reference to the protocols will show that laceration of the perineum occurred in eighteen of the fifty deliveries and in eleven of them the labor was normal. In each instance the laceration was sutured immediately, and healing per primam was the invariable result. As fifteen of the eighteen patients had an afebrile puerperium, it would appear that the presence of a perineal wound had absolutely no effect on the character of the uterine lochia.

Cervical lacerations were noted twelve times, though eleven of the patients in whom they occurred had perfectly spontan-

TABLE III.

APYREBRILE SERIES.

APYREBRILE.	FIRST DAY					THIRD DAY					SEVENTH DAY				
	Cases	Per-centage	Gon-ococci	Nega-tive	Posi-tive	Cases	Per-centage	Gon-ococci	Nega-tive	Posi-tive	C ses	Per-centage	Gon-ococci	Nega-tive	Posi-tive
	40					40					40				
Smears and cultures, negative	37	92.5		92.5		25	62.5		62.5		20	50		50	..
Smears, positive; cultures, negative							12.5					10			
Gonococci						5		12.5			2		5		
Other (?) intracellular diplococci											1				2.5
Other (?) intracellular bacilli						...		...			1				2.5
Smears, negative; cultures, positive		5					12.5					5			
Anaërobic micrococci	1				2.5	1				2.5	1				2.5
Gonococci						1		2.5			1		2.5		
" and M. albus						1		(2.5)		2.5					
M. Cereus flavus						1				2.5					
B. Dysenteriæ						1				2.5					
B. Coli	1				2.5	...									
Smears and cultures, positive		2.5					12.5					35			
Gonococci	1		2.5			3		7.5			5		12.5		
" and other (?) diplococci	...		...		.. .	.. .	...				2		(5)?	.	5
" and bacilli								...			2		(5)		5
Micrococci aërobic							.. .				2				5
" aaënrobic						1				2.5	1			.. .	2.5
B. Coli	..			.. .		1				2.5	1		.. .		2.5
B. Pseudo-diphtheriæ											1		.. .		2.5
Total	40	100	2.5	92.5	5	40	100	22.5	62.5	15	40	100	20	50	30
			95					85					70		

TABLE IV.

FEBRILE SERIES.

FEBRILE.	FIRST DAY					THIRD DAY					SEVENTH DAY				
	Cases	Per-centtage	Gono-cocci	Nega-tive	Posi-tive	Cases	Per-centtage	Gono-cocci	Nega-tive	Posi-tive	Cases	Per-centtage	Gono-cocci	Nega-tive	Posi-tive
	10					10					10				
Smears and cultures, negative	9	90		90		4	40		40		2	20		20	
Smears, positive; cultures, negative						1	18					10			
Diplococci (gonococci)	1	10	10				1	10			1		10		
Smears, negative; cultures, positive							10								
Anaërobic micrococci						1				10					
Smears and cultures, positive							40					70			
Gonococci											3		30		
Micrococci						2				20					
Streptococci and bacilli						1				10					
Anaërobic bacilli						1				10	3				30
B. Subtilis											1				10
Total	10			90	10	10		10	40	50	10		40	20	40
								50							

SUMMARIES OF CLINICAL

1	W. Y. H 1583.	B. M. v p.		N. L. O. I. T.	19 hrs.	20 min.		4
2	S. D. H 1780	B. S. i p.	Leucorrhea. Dysuria.	N. R. O. I. T.	26½ hrs.	15 min.	Cervical laceration.	1
3	M. H. H 1596	B. S. i p.	Leucorrhea Toxemia.	N. R. O. I. A.	22 hrs.	5 min.	Periurethral tear.	3
4	J. G. H 1624	B. M. v p.	Leucorrhea. Fever during labor.	Acc. forcée. R. S. I. A.	10 hrs.	8 min.	Perineal tear.	3
5	N. B. H 1614	B. S. i p.	Chancroids. Dysuria.	N. L. O. I. A.	5½ hrs.	10 min.	Perineal tear.	0
6	E. R. H 1781	B. S. i p	Leucorrhea. Syphilis (?)	N. L. O. I. A.	41½ hrs.	5 min.		2
7	C. S. H 1713	W. S. i p.		N. L. O. I. A.	17¼ hrs.	10 min.	Cervix lacerated.	1
8	A. T. H 1681	B. M. iii p.	Old vaginitis. Previous child had gonorrheal opththalmia.	N. L. S. I. A.	7¼ hrs.	10 min.		0
9	B. L. H 1597	W. M. xi p.		Version and Extraction R. O. I. T.	84 hrs.	26 min.	Perineal tear. Cervical tear.	4
10	L. S. H 1662	B. M. ii p.	Fever during pregnancy.	N. L. O. I. P.	13½ hrs.	10 min.		1

NOTE.—B, black. W, white. M, married. S, single. N, normal.

eous labors. Though such tears were noted in three febrile cases, there was apparently no reason to believe that their presence exercised any effect on the uterine lochia. The most striking fact in connection with such tears is their unexpected frequency; as in most of the patients their existence was not suspected until revealed by examination with the speculum. However, as the evidence of their presence had disappeared in all but one case by the fourteenth day, a routine examination for, and the suture of such lacerations where found, would seem wholly unnecessary. This, of course, does not apply to deep lacerations occurring in the course of operative delivery, which not only afford foci of lessened resistance should infection occur, but are also to be feared on account of hemorrhage.

EFFECT OF VAGINAL EXAMINATIONS.

Vaginal examinations, when conducted under aseptic precautions, have but slight influence on the presence or absence

HISTORIES. FEBRILE SERIES.

102[3] 2d day.	O	O	O	O	O	O	Acute pharyngitis.
102[4] Initial.	"	"	"	Anaerobes.	Bacilli.	Anaerobes.	Retained membranes. Subinvolution.
100[8] 2d day.	"	"	"	O	Diplococci.	O	Retained membranes. No hydrocele media.
101[9] 9th day.	"	"	"	"	Gonococci.	Gonococci.	Child macerated.
103[5] 13th day.	"	"	"	"	Gonococci.	Gonococci.	Pelvic peritonitis. Subinvolution.
101[6] Initial.	"	"	Micrococci	No growth solids. Foul smelling gas producer.	Cocci and bacilli.	B. Subtilis and a foul smelling bacillus.	Subinvolution.
102[4] 4th day.	"	"	Diplococcus neg. to Gram.	Diplococcus growth only in milk.	O	O	Subinvolution.
102[2] 4th day.	Three smears show micrococci	"	Two organisms seen in smears.	O	Definite gonococci.	Gonococci.	Child premature. Slight subinvolution.
104[6] 3d and other.	O	"	Bacilli cocci.	Streptococci. Bac. Aer. capsulatus.	Bacilli.	Bacillus Aerogenes capsulatus.	Vaginal pack.
105[8] 11th day.	"	"	Bacilli.	Bac. Aer. capsulatus.	Bacilli.	Bac. Aer. capsulatus.	Hysterectomy.

of bacteria. Thus, four out of six afebrile cases, which were not examined during labor, later showed bacteria in the lochia, B. coli being present once and gonococci three times. The latter organism was also demonstrated in the lochia of two febrile cases that were not examined vaginally during labor. On the other hand, one afebrile case was examined six times during labor and no bacteria were at any time demonstrable in the lochia.

EFFECT OF OPERATIONS.

Ten of our fifty cases underwent operation. In the febrile series one woman delivered by accouchement forcé, showed gonococci in the lochia, while a second upon whose child version was performed, was the instance of streptococcus infection. Of the remaining eight, three, one each low forceps, version and induced labor, were at all times free from bacteria; three others, two low forceps and one introduction of a Champetier de Ribes balloon, showed gonococci; while two, one a mid-forceps, and

SUMMARIES OF CLINICAL

CLINICAL.

No.	Name.	Condition.	Pregnancy.	Labor.	Duration of Labor.		Cervix and Perineum.	Times Examined.
					Total.	3d stage.		
1	A. F. H1593	W. M. ii p.		Normal. L. O. I. A.	10 hrs.	17 min.		1
2	I. D. H1609	W. S. ii p.		N. L. O. I. A.	8¾ hrs.	17 min.	Cervix torn.	3
3	D. C. H 1621	B. M. ii p.	Leucorrhea.	N. R. O. I. A.	4 hrs.	15 min.		2
4	N. J. H 1599	W. S. i p.		N. L. O. I. A.	21 hrs.	25 min.		0
5	C. H. H 1645.	B. M. iv p.		N. L. O. I. T.	3½ hrs.	13 min.		2
6	H. M. H 1653	W. S. i p.		N. L. O. I. A.	23½ hrs.	10 min.		0
7	S. K. H 1666	W. M. i p.		N. L. O. I. T.	34 hrs.	30 min.	Cervix torn.	3
8	S. B. H 1661	B. S. i p.		N. R. O. I. P.	11 hrs.	23 min.		1
9	M. O. C. H 1742.	W. M. ii p.	Leucorrhea.	N. R. O. I. A.	5¾ hrs.	14 min.	Cervix torn.	2
10	I. W. H 1791.	B. S. ii p.		N. R. O. I. P.	6¼ hrs.	10 min.	Cervix torn.	1
11	E. M. H 1784.	B. M. i p.	Leucorrhea.	N. L. O. I. A.	6¼ hrs.	15 min.		1
12	L. S. H 1753	B. M. iii p.	Leucorrhea. Dysuria .	N. L. O. I. A.	39½ hrs.	13 min.		2
13	B. H. B. H 1589.	B. M. i p.	Leucorrhea.	N. L. O. I. T.	21¼ hrs.	14 min.		4
14	L. F. H 1622.	W. M. ii p.		N. R. O. I. A.	10¾ hrs.	2 min.		2
15	A. E. H 1821	W. M. i p.	Leucorrhea.	L. O. I. A.	18 hrs.	15 min.	Perineal laceration. Cervical laceration.	1
16	N. W. H 1766.	B. M. iv p.		Introduction of bougie. L. O. I. A.	123½ hrs.	17 min.		6
17	M. S. H 1606	B. M. ii p.		Low forceps. L. O. I. T.	17 hrs.	10 min.	Perineal laceration.	4
18	R. H. H 1797.	B. M. ii p.	Leucorrhea. Twins.	Version and Extraction. Rt. Acr. I. D. A. L. Acr. I. D. P.	?	10 min.		2
19	E. H. H 1576	B. S. i p.	Toxemia.	N. R. O. I A.	24 hrs.	10 min.		3
20	M. K. H 1588	W. S. i p.		N. L. O. I. A.	11½ hrs.	13 min.	Perineal tear.	3

HISTORIES. AFEBRILE SERIES.

Max. Temperature	Cultures. After Labor. Smears.	Cultures. After Labor. Growth.	Cultures. Third Day. Smears.	Cultures. Third Day. Growth.	Cultures. Seventh Day. Smears.	Cultures. Seventh Day. Growth.	Remarks.
99.8 4th day.	O	O	O	O	O	O	
99.2 2d day.	"	"	"	"	"	"	
99.3 3d day.	"	"	"	"	"	"	
99.2 6th day.	"	"	"	"	"	"	Mother subinvolution. Child ophthalmia simplex.
99.4 2d day.	"	"	"	"	"	"	
99.8 (100.8 Initial.)	"	"	"	"	"	"	
99.4 5th day.	"	"	"	"	"	"	
99.4 5th day.	"	"	"	"	"	"	Posterior rotation of occiput.
100.0 Initial.	"	"	"	"	"	"	Slight subinvolution.
99.7	"	"	"	"	"	"	
100.5 Initial.	"	"	"	"	"	"	
100.6 6th day.	"	"	"	"	"	"	
99.2	"	"	"	"	"	"	Placental syphilis.
99.6	"	"	"	"	"	"	Subinvolution.
100.0	"	"	"	"	"	"	
99.7	"	"	"	"	"	"	
100.4	"	"	"	"	"	"	
100.4	"	"	"	"	"	"	Douche after 3d stage.
100.2	"	"	"	"	"	"	
100.4	"	"	"	"	2 diplococci Retain Gram.	"	Organisms in one of three smears.

21	H. C. H 1605.	B S. ip.	Leucorrhea.	Low forceps. R. O. I. A.	26½ hrs.	10 min.	Perineal tear. Cervical tear.	5
22	L. S. H 1594	B. S. iip.	Gonorrheal vaginitis. Syphilis (?)	Breech extraction. L. S. I. A.	7¾ hrs.	10 min.	Perineal tear. Cervical tear.	2
23	E. W. H 1602	W. M. ip.		N. R. O. I. A.	50 hrs.	17 min.	Perineal tear.	1
24	S. C. H 1823	W. M. ip.	Leucorrhea. Dysuria.	N. R. O. I. A.	15½ hrs.	25 min.	Perineal tear.	2
25	M. S. H 1590	W. S. ip.	Leucorrhea. Slight toxemia.	N. L. O. I. A.	30 hrs.	30 min.		3
26	N. M. H 1571	B. M. ip.	Leucorrhea.	N. L. O. I. A.	9½ hrs.	15 min.	Perineal tear.	3
27	P. L. H 1595	B. M. ip.	Leucorrhea.	N. R. O. I. T.	12¼ hrs.	12 min.		3
28	A. H. H 1657	B. M. vp.		De Ribes's bag. Extraction. R. S. I. A.	32½ hrs.	13 min.	Perineal tear.	3
29	E. C. H 1578	B. S. ip.	Bartholinitis.	N. L. O. I. T.	25¼ hrs.	23 min.		3
30	D. E. H 1794	W. S. ip.		N. L. O. I. A.	11 hrs.	15 min.		0
31	M. F. H 1726	W. S. ip.	Leucorrhea. Vaginitis.	N. L. O. I. T.	8¼ hrs.	11 min.	Cervical laceration.	3
32	V. J. H 1715.	B. M. ip.		Mid. forceps. L. O. I. P.	24 hrs.	17 min.	Perineal tear.	4
33	M. W. H 1524.	B. S. iip.	Cystitis.	Version and Extraction.	78½ hrs.	5 min.	Perineal tear.	6
34	I. C. H 1694	W. S. ip.	Granular Vaginitis.	Low forceps. L. O. I. A.	9½ hrs.	12 min.	Perineal tear.	4
35	A. W. H 1656	W. S. ip.		N. L. O. I. A.	12 hrs.	35 min.	Perineal tear.	0
36	L. B. H 1759.	B. M. xip.	Syphilis, Hydramnios.	N. R. O. I. A.	12½ hrs.	9 min.	Cervical laceration.	2
37	B. C. H 1679	B. M. iiip.		N. L. O. I. T.	9¼ hrs.	3 min.		2
38	R. A. H 1716	B. S. ip.	Leucorrhea.	N. L. O. I. A.	7½ hrs.	8 min.	Perineal laceration.	2
39	N. E. H 1663.	B. S. ip.	Syphilis (?).	N. L. O. I. A.	14 hrs.	7 min.	Perineal tear.	0
40	B. K. H 1815.	W. M. ivp.	Complete perineal tear.	N. L. O. I. A.	2¾ hrs.	20 min.		0

100^{4}	O	O	O	O	Diplococci.	Gonococci.	
99^{8}	"	"	"	"	Gonococci.	Gonococci.	Vagina smooth at discharge.
99^{2}	"	"	"	"	Diplococci.	Acidity in milk. No transfers.	Possibly gonococci.
100^{2}	"	"	"	"	Diplococci.	Aerobic diplococci gas. Anaerobes Nil.	-SubinvolutionD. and C. Cervix not exposed 3d.
100^{4}	"	"	Diplococci. Gonococci.	"	O	O	
99^{7}	"	"	Gonococci.	"	Gonococci.	"	Child developed ophthalmia.
99^{2}	"	"	Gonococci.	"	Gonococci.	"	Subinvolution. Membranes retained.
100^{0}	"	"	Gonococci.	"	O	Definite gonococci.	Douche after 3d stage for Postpartum hemorrhage. Subinvolution.
100^{2}	"	"	Gonococci.	"	Gonococci.	Gonococci.	
99^{5} (100^{8} initial.)	"	"	O	Gonococci. M. Albus.	Gonococci bacilli.	Gonococci. Putrefactive bacilli.	Note: Single colonies of M. albus on two tubes. Bacilli only noticed in bouillon; no growth on solid media.
99^{6}	"	"	"	Gonococci.	Gonococci.	Gonococci, also gram and diplococci.	Subinvolution.
100^{2}	"	"	"	M. Cor. flavus. An. and Aer.	Diplococci bacilli.	B. psuedo diphtheriæ	Second culture obtained after difficulty.
99^{8}	"	"	"	B. Dysenteriæ.	Intracellular organisms.	O	Patient resisted second culture.
99^{4}	"	"	Gonococci.	Gonococci.	Gonococci.	Gonococci.	Subinvolution. Child ophthalmia Later, pelvic inflammatory dis'se.
100^{5}	"	"	Gonococci.	Gonococci.	Gonococci and bacilli.	Gonococci and bacilli.	Subinvolution.
99^{8}	"	"	Diplococci.	Gonococci. Diplococci.	Diplococci.	Gonococci. Diplococci.	Subinvolution.
100^{1}	"	"	Diplococci.	Anærobic diplococci.	Diplococci.	Anærobic diplococci.	
100^{3}	"	Anærobic micrococci.	O	Anærobic micrococci.	O	Anærobic micrococci.	One or two colonies in solid media not transferable.
100^{2}	Gonococci.	Gonococci.	"	O	Gonococci.	Gonococci.	First tube broke in cervic flow.
99^{4}	O	B. Coli, 2d colonies.	B. Coli.	B. Coli.	B. Coli, few.	B. Coli, few.	

the other a version and extraction, showed in one instance a variety of B. dysenteriæ on the third day, and in the other M. aureus on the third day and B. pseudo-diphtheriæ on the seventh. The former of these two was undoubtedly contaminated at the time of taking the culture, and the picture on the seventh day when all the organisms seen had been ingested by leucocytes, suggested the possible fate of many other bacteria that must undoubtedly have been introduced during these several operations, in each of which the entire hand was introduced into the uterine cavity. This evidence of phagocytosis on the part of the leucocytes, together with the fact that bacteria are so rarely found in the lochia at the completion of labor, would appear a strong argument against the use of post-partum douches. Not only does the free flow of blood from the placental site act as a mechanical and bactericidal douche, but as Wright and Douglas have recently pointed out, the unaltered blood serum is an indispensable factor in the process of phagocytosis.

CONCLUSIONS.

I. In fifty consecutive women whose lochia were examined immediately after labor and on the third and seventh days of the puerperium, the uterus was absolutely sterile in 92, 50, and 44 per cent. of the cases, respectively.

II. Counting as negative the cases in which gonococci were present, the figures are 96, 72, and 67 per cent.

III. The puerperium was normal in forty and febrile in ten cases. In the former, the percentages of absolute sterility were 92.5, 62.5, and 50 per cent., as compared with 90, 40, and 20 per cent. in the latter; or, counting as negative the gonorrheal cases, the figures are 95, 85, and 70 per cent., and 100, 50, and 50 per cent. respectively.

IV. The results were considered as positive when bacteria were found only in smear preparations or only in cultures, as well as when present in both. Accordingly, it is probable that a certain number of the positive results were due to contamination, and that the uterus is really sterile in a larger proportion of cases than indicated by our figures.

V. The streptococcus was found but once in the entire series, being present in a febrile case on the third day, but absent on the first and seventh days

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A CASE OF CONGENITAL HEART DISEASE: TRANSPOSITION OF THE AORTA AND PULMONARY ARTERY; PATENT FORAMEN OVALE AND DUCTUS ARTERIOSUS.*

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(With one plate.)

From the laboratories of the Jefferson Medical College and Philadelphia General Hospitals.

THE subject from whom was obtained the specimen forming the basis of this paper was a male infant who died when thirty-four days old. The privilege of reporting the case I owe to Dr. G. M. Boyd, in whose service at the Philadelphia Hospital it occurred. For the following clinical notes I am indebted to the resident physician Dr. Wyeth. At birth the patient was a poorly nourished, unhealthy looking infant weighing 7 lb. ½ oz. It was extremely cyanotic, the whole body being of a bluish color. Respiratory difficulty was present. September 2, eleven days later, the notes are: "Patient continues to be cyanotic and still has more or less labored respiration. Nurses fairly well and sleeps a great deal." On September 8 the baby was put on modified milk, the mother having been moved to another ward. It continued about the same except that at intervals it would become normal in color for a short time and then again become cyanotic. It had steadily lost weight since birth. September 15: "Baby about the same. Sleeps almost continuously. Cries but little. Has gained 5 ounces in the past week but still continues to be cyanotic." September 22: "Baby now weighs 7 pounds. Takes bottle fairly well but is unhealthy looking.

* Read before the Section on Gynecology, College of Physicians of Philadelphia, March 16, 1905.

Color at times clears up somewhat but is bluish the greater part of the time; cyanosis, however, is not so great as formerly." September 25: "Baby to-day suddenly became extremely cyanotic, and the respirations were labored and irregular. During this attack it gave a few gasps and died." The day before it died the baby weighed 7 lbs. 4 oz.

At the post mortem held September 27, 1904, the findings were as follows: Pathological Diagnosis:—Transposition of the aorta and pulmonary artery; patent foramen ovale; patent ductus arteriosus; hypertrophy of right ventricle; partial atelectasis of left lung; congestion of all viscera.

The body is that of a fairly well nourished male infant. The mucous membrane of the lips is dark blue in color. The finger and toe nails, especially those on the toes of the right foot, are very blue. Clubbing of the digits is not present. The anterior surface of the chest and abdomen is slightly blue. Peritoneum contains 10 c.c. of blood-stained fluid. Pleuræ and pericardium are normal. The thymus gland is normal in appearance; the left lobe is 4 cm., the right 3.5 cm. in length. The structures at the root of the neck show no gross lesion.

The heart is slightly more globular than is usual for that organ, owing to increased size of the right side, particularly the ventricle; the apex, however, is formed by the left ventricle. In thickness, the wall of the right ventricle is 7 mm., of the left 5 mm. The aorta arises from the right ventricle at the site normally occupied by the pulmonary artery. Beyond its origin it follows the normal course, gives off the usual three large branches from its arch, and beyond them is joined by the ductus arteriosus. The coronary arteries are given off by the aorta. The pulmonary artery arises from the left ventricle exactly at the point where the aorta normally emerges. It divides into the right and left branches which pass to the respective lungs and nearly at the point of bifurcation, but rather more from the left branch, gives off the ductus arteriosus. From its point of origin until it bifurcates the pulmonary artery is slightly larger than the aorta. There is no evidence of stenosis in either vessel.

The foramen ovale is patulous in the shape of a slit-like opening between the margin and the valve which slightly overlaps it. The opening is 0.5 cm. long. The ductus arteriosus is also patulous, admitting with ease a probe 2 mm. in diameter; externally it is larger at the pulmonary end. Neither the ventricles nor the auricles are transposed and the veins entering the latter cavities



TRANSPOSITION OF THE VASCULAR TRUNKS.—ELLIS.

A. Aorta which arises from the right ventricle. B. Right ventricle laid open. C. Innominate. D. Common carotid. E. Subclavian. F. Left branch of pulmonary artery; the right can be seen passing under the aorta and from the point where the right and left pulmonary arteries are given off by the main trunk. G. The ductus arteriosus. H arises and passes upwards to the aorta (A). I. Left auricle. J. Right auricle. K. Left pulmonary vein. L. Left coronary artery, which arises 0.7 cm. above the origin of the abnormally placed aorta. M. Left ventricle, its wall thinner than that of the right. N. Left lung. O. Right lung.

are normal in number and bear their usual relations. There is no opening in the interventricular septum. The right lung is dark in color posteriorly, but crepitates throughout. The left lung, except along the anterior margin, is almost or quite airless, probably antenatal in origin. There is no evidence of obstruction in any portion of the large respiratory passages. The abdominal viscera are on section darker than usual and contain a slight excess of blood; otherwise they are normal in appearance.

Congenital malformations of the heart form a group of anomalies interesting alike to the clinician and to the pathologist. The usual symptom-complex during life—cyanosis, respiratory disturbance, cardiac murmur, malnutrition, clubbed digits, polycythemia—is well known to all. The possibilities of autopsy findings are so numerous and so varied as to be almost confusing. Malformations of the great vessels alone, with which this paper has mainly to deal, are widely diverse in nature. It is not my intention fully to discuss even this one group, but to mention many of the lesions only in comparison, as to frequency, gravity, and associated abnormalities.

Cases of congenital heart disease, based on the time and method of formation, may be roughly divided into two groups: 1. the developmental group, embracing malformations occurring necessarily in the embryonal period; 2, those arising principally or entirely during fetal life. The latter appear largely due to fetal endocarditis and affect chiefly the valves or the beginning of the vascular trunks. It must be remembered, however, that endocardial affections are more easily engrafted upon abnormal structures, hence certain instances of this class doubtless have their real beginning in embryologic errors. Of interest in this connection are the studies of Robinson[1] upon the relation between congenital malformations of the heart and postnatal acute endocarditis. He collected seventeen cases and adds two personal observations. He concludes that the occurrence of acute endocarditis with extensive cardiac malformations is rare in spite of the fact that the latter predisposes to the former. The reason is that malignant endocarditis is a disease of middle life, while few subjects cases of congenital heart disease live beyond childhood. The case herein reported belongs unmistakably to the purely developmental group.

The real cause of malformations of this group is very often a matter of conjecture. Moussous[2] says the influence of heredity is undeniable and cites numerous familiar series. Monti[3] also

states that congenital heart lesions may occur in several generations of the same family and Peacock[4] names heredity as an etiologic factor. De La Camp[5] describes six cases occurring in the brothers and sisters of one family. All were diagnosed as instances of persistent ductus arteriosus, but as the diagnoses were unsupported by autopsy, their accuracy regarding the particular lesion is questionable; that they were instances of congenital heart disease we have no reason to doubt. Both Moussous and Monti state that malformations are favored, if not actually caused, by certain constitutional vices, particularly syphilis. Outside of these factors the etiology is vague, but Moussous says that in this connection two points are to be remembered: (1) The frequent coincidence of cardiac with other malformations; (2) their association with nervous maladies, as hysteria, idiocy and the like. Colbeck[6] says that attributing to maternal impressions a causative rôle savors more of superstition than of scientific reasoning; he ascribes abnormalities largely to mechanical causes. Peacock, however, considers it reasonable to believe that such impressions may be active in producing anomalies by deranging the maternal and fetal circulations. Fetal endocarditis is, of course, chiefly, probably exclusively, maternal in origin.

The mechanism of the production of transposition of the aorta and pulmonary artery, whatever may be its cause, is quite definitely understood. In the formation of the heart, the primary cylindrical tube tapers anteriorly to form the aortic bulb which carries the blood away from the heart. Later the tube becomes twisted on itself, assuming an S-shape, and the cavities are separated. While these changes are occurring a partition known as the aortic septum makes its appearance in the aortic bulb, being formed by the fusion of the free edges of two ridges which develop on opposite sides of the bulb.[7] This septum extends downward until it reaches the ventricle, where it fuses with the free edge of the ventricular septum and so completes the separation of the two ventricles. The surfaces of the septum are at first directed laterally; it then twists until they face anteriorly and posteriorly. This results in the formation of two tubes lying side by side, the one anterior and to the right, later the pulmonary artery, the other posterior and to the left, destined to become the aorta. Finally two grooves, opposite the position of the septum, appear on the outside, deepen, and ultimately divide the bulb into separate vessels. Ordinarily this is completed by the end of the seventh week

Transposition of the aorta and pulmonary artery, then, is due to lack of rotation of the septum which forms them. In typical cases, the aorta is in front and to the right, the pulmonary artery behind and to the left. At one stage in the normal process both vessels are connected with the right ventricle, the change of the aorta to the left being largely accomplished by the completion of the interventricular septum. Irregularities in the formation of this septum, especially its deviation to the right or the left, may result in both vessels arising from one or other of the ventricles, more often the right, an anomaly not exceedingly rare. Transposition of the vessels may be accompanied by transposition of the auricles and veins,[8] or of the ventricles, or of both. The transposed vessels may be normal, but usually are not. The interventricular septum may be incomplete, but most often is perfect. The foramen ovale has been patulous in the large majority of cases reported. The ductus arteriosus is occasionally impervious, more often than is the foramen ovale.

An open foramen ovale may be due to one of several causes. The parts of the auricular septum, as they develop, may stop short of their usual extent; the membrane that performs the function of a valve may be deficient and thus leave an opening that in size will depend upon the extent of the deficiency; the margins and valve may be perfect but adhesions between the two fail to occur, thus leaving a slit-like, diagonal communication between the two auricles. The last may or may not permit the admixture of blood from the two cavities, this occurring only when the pressure in the left auricle becomes less than that in the right. Morse[9] says prematurity appears to be more important as a factor in the etiology of patent foramen ovale than it is the production of any other malformation.

The ductus arteriosus, which is formed from the fifth left aortic arch, commonly closes by the twentieth day after birth. Parrot (quoted by Moussous) says closure is accomplished by proliferative changes in the media, followed shortly by a like process in the intima; the narrowed lumen is then closed by fibrin which finally is substituted by fibrous tissue. Lack of these changes, resulting in persistence of the ductus, is usually the result of circulatory demands made upon it by reason of other malformations; in the majority of instances the pulmonary artery is stenosed or entirely occluded. In a few cases the ductus has remained patulous in the absence of other anomalies. Such

instances are probably due to inherent lack of obliterative changes in the vessel walls, and appear unexplainable.

Frequency of the Lesions Found in the Present Specimen.— 1. Transposition of the aorta and pulmonary artery is one of the rarer congenital abnormalities of the heart. The first case on record was reported by Dr. Baillie in 1797. Peacock, in his classic book, written in 1866, mentions 29 cases of pure or complicated transposition of the trunks. Rauchfuss[10] collected 25 cases, 13 of which are included in the list of Peacock. This makes 41 cases up to 1878. Later writers of monographs on the subject, as Carpenter, Moussous[11] and Colbeck, make no attempt at collating cases. I have not made an exhaustive search of literature, but have found references to 6 cases in addition to the one herein reported, making a total of 48. If the 5 cases tabulated by Moussous in 1895 are in addition to those previously reported, which is probable, the total would be increased to 53. The entire number of cases is probably less than 70. In the majority of reported cases, both the foramen ovale and the ductus arteriosus were open, the former in the larger number of instances. In a few cases the interventricular septum was deficient. Peacock says that in 3 out of 4 cases in which the septum between the ventricles was imperfect, the ductus was occluded. He also states that the lumen of the ductus is sometimes very small, even when the ventricular cavities are entirely separated, and in 4 such cases it is said to have been entirely obliterated. In this type of abnormality, transposition, intercommunication between the pulmonic and systemic circulations by the auricular or the ventricular septum or by the ductus is commonly believed to be essential to extrauterine life.

Associated lesions in some of the cases of transposition make the latter abnormality only partially complete. In three of Peacock's cases there was but a single ventricle from which arose both vessels, but their point of origin was transposed. In another the pulmonary artery arose from the left ventricle and the aorta from both ventricles. Peacock says that deficiency of the interventricular septum, with the aorta arising wholly or in part from the right ventricle, is of frequent occurrence. This was also found in a number of cases by Carpenter. The opposite condition, deviation of the septum to the right with the pulmonary artery and aorta arising from the left ventricle, is a very rare anomaly.

In the specimen of transposition shown by Theile[12] the ventricles were completely separated; no mention is made of the foramen ovale or of the ductus arteriosus. The case reported by Cowan and Ferguson[13] was one of five cases of congenital heart disease; both the foramen ovale and the ductus were patulous. The left common carotid was given off by the innominate. The coronary arteries arose from the right ventricle vessel, a condition they have seen in only one other specimen; this is found in our case. The case of Demelin[14] was one of transposition with interventricular communication. The greatest point of interest was that the diagnosis of cardiac malformation, though not the exact type, was made during pregnancy, being based on the slowness of the fetal heart beat, 50 per minute.

Malformations of the great vascular trunks, other than transposition, are mainly stenosis or atresia near their origin, involving principally the pulmonary artery, this being the commonest of all congenital anomalies. Of Peacock's 181 cases, 119 possessed lesions at the pulmonary orifice. Of Moussous's 142 tabulated cases, 102 included pulmonary lesion and 8 aortic anomaly; 8 had a single arterial trunk. Williams,[15] Gibson,[16] Thompson and Drummond,[17] Bellot,[18] Zariquiey,[19] Darrach,[20] Cade,[21] and Curl[22] report cases of entire absence or atresia of the pulmonary artery. Cases of stenosis, atresia, or absence of the aorta are cited by Thompson and Drummond, Laine,[23] and Peacock. Goodhart and Still[24] speak of contraction of the aorta beyond the origin of the left subclavian. Sometimes the vessel is completely obliterated, the ductus arteriosus being closed or open. Even complete obliteration is compatible with life for many years, two reported cases dying respectively at 27 and 37 years. The left heart is enlarged. The circulation at the base of the trunk being supplied by the vessels of the neck, enlargement of the surface vessels may allow of recognition of the condition. Instances of the aorta arising from both ventricles are reported by Graham and Rosenberger,[25] Gutkind,[26] Rex,[27] and Variot.[28] Coplin, in an unpublished case, found deficient interventricular septum, patent foramen ovale and ductus, pulmonary stenosis, and aorta arising from both ventricles. Wright and Drake[29] report a case of greatly malformed heart which possessed a single large vessel arising from a single ventricle. Hektoen[30] reports a case of defective septum between the aorta and pulmonary artery and tabulates 9 others, all the instances of the lesion that had been reported. Oberwinte[31] has since observed

another case. Instances of most of these lesions might be many times multiplied but my purpose has been simply to illustrate the various abnormalities of the vessels that may occur rather than to collect all the cases.

Patulous Foramen Ovale.—This condition, or the closely allied one of deficiency in the auricular septum, is a very common defect of the heart, the most frequent of all according to Moussous, occurring alone or associated with other anomalies. Colbeck names as ways in which the interauricular septum may be deficient: 1. Absence of the anterior muscular portion of the septum; 2. Complete patency of the foramen; 3. Incomplete closure of the valve; 4. Perforations around edge of membrane; 5. Oblique opening betwee the edge of the valve and the margin of the opening; 6. Cribriform membrane. Of 9 cases of congenital heart disease reported by Thompson and Drummond, 7 included patency of the foramen. Rogers and Fortescue-Bricksdale, Carpenter, and Curl[32] report 3 cases, in all of which the foramen was open. Of 7 cases reported to the Pathological Society of Philadelphia, or mentioned in discussions, all showed interauricular communiaction, 6 being open foramina. Goodhart and Still, and most other writers, place patent foramen ovale as second in frequency of malformations, pulmonary stenosis being first. In the 25 cases of transposition of the aorta and pulmonary artery collected by Rauchfuss, 19 possessed patulous foramina. In 4 of Cowan and Ferguson's 5 cases of congenital disease, the foramen was open. Rudolf, in reporting a case, says it is not uncommon for a slight opening in the foramen to persist into adult life. I have observed one instance in a woman past 70.

Patent Ductus Arteriosus.—As before stated, in a few instances non-closure of the ductus has been the only lesion present, but in the great majority of cases there were associated abnormalities. It is present in a large percentage of cases of transposition of the great trunks, 17 of Rauchfuss's 25 cases, and also accompanies many cases of stenosis or occlusion of the pulmonary artery. In order of frequency, Goodhart and Still place it third among malformations.

Condition of the Heart as Result of Transposition.—In the absence of malformations involving the cavities of the heart, and abnormalities other than malposition in the vessels themselves, the principal change in the heart as the result of transposition is hypertrophy of the right ventricle, which is almost constant, the wall usually being thicker than that of the left ventricle. In two

of the cases observed by Rauchfuss, the wall of the right ventricle was in each 5 mm. thick, of the left ventricles, 2 and 3 mm. respectively; in the third case the right and left were equal, 4mm. In the case of Cowan and Ferguson, both the right ventricle and auricle were hypertrophied and dilated; the left ventricle also was hypertrophied and formed most of the apex of the heart.

Diagnosis.—The consensus of opinion of almost all writers upon the subject is well voiced in the statement of Humphry[33] that the diagnosis of transposition of the aorta and pulmonary artery by physical cardiac signs is impossible. Peacock says that when an infant suffers from great difficulty in breathing and from palpitation, and is intensely and constantly cyanosed at or immediately after birth, we may infer the presence of some serious malformation occasioning great obstruction to the blood, as obliteration or great contraction of the pulmonic orifice or transposition of the aorta and pulmonary artery; definite diagnosis of the latter, however, cannot be made. Carpenter, after stating that the condition cannot be diagnosed, adds that a septal murmur from associated perforate ventricular septum may be heard, but if the patient is more than three years old, transposition is not in the least likely. Moussous gives as physical signs of the condition, a feeble first sound at the apex with exaggeration of the valvular sound at the base; signs of hypertrophy of the right ventricle are usually present. With added interventricular communication, precordial dullness is increased and in some instances there is at the base a systolic murmur without definite propagation. Cyanosis is intense and there is extreme tendency to palpitation and the phenomena of asphyxia. Moussous, however, does not claim these signs are distinctive.

Regarding the diagnosis of patent foramen ovale there is difference of opinion. Colbeck says it is unaccompanied by any known symptom or physical sign. Moussous states that some have claimed to diagnose interventricular opening by means of systolic or presystolic murmurs. He doubts the claim because of the comparatively small force of auricular contraction, regardless of the way in which the blood flows. Goodhart and Still say, "Patent foramen ovale, although occasionally associated with cyanosis without other malformation, has so frequently been found without symptoms of any kind that it can seldom be diagnosed." Morse, among 32 cases of congenital heart disease, made the diagnosis of open foramen ovale in 6; as none

of the cases came to post mortem, the diagnosis must of course be accepted with reservation. Williams made the diagnosis in his case because of the sharp "click" heard before systole. On the whole, it appears that the diagnosis of patent foramen ovale, or deficient interauricular septum, rests on no sound basis.

Patent ductus arteriosus is difficult to diagnose. Colbeck says that if with the symptoms and signs of pulmonary stenosis, hypertrophy of the right ventricle is greater than the pulmonary narrowing, otherwise estimated, accounts for, then patent ductus arteriosus may be suspected. This suspicion is strengthened by accentuation of the pulmonary second sound. Morse considered patent ductus probable in five of his cases. Francois-Franck, quoted by Moussous, furnishes an ingenious explanation of what appears to be rather easily recognized signs of this lesion. An intense murmur is heard posteriorly, to the left of the vertebral column, at the level of the third or fourth vertebra; it is increased during inspiration and diminished during expiration. The pulse exhibits an inequality in the amplitude of the beats; there are 4 or 5 strong pulsations, then 5 or 6 feeble ones, these variations corresponding to the movements of respiration. The explanation of the murmur and the pulse is this: During inspiration, the blood passes most readily into the lungs and consequently at this time blood from the aorta rushes through the ductus into the pulmonary artery, giving rise to a loud murmur and several feeble pulse beats. During expiration, less blood passes into the lungs and less from the aorta through the ductus; while this obtains, the murmur is diminished and the pulse is strong. This explanation will suffice only for cases in which stenosis or occlusion of the pulmonary artery accompanies patency of the ductus, thus necessitating the pulmonary blood supply from the aorta; as the two lesions are commonly associated it will answer for most cases.

Prognosis.—Transposition of the great vessels is incompatible with more than a comparatively short period of existence. The oldest subject in the series recorded by Peacock was 2 years and 9 months, the youngest 10 hours. Only 5 passed 1 year and but 9 exceeded the age of 6 months. Of the 25 cases collected by Rauchfuss, 20 died before the age of 10 months, the oldest mentioned being 2 years and 8 months. The ages of the 5 mentioned by Moussous ranged between 2 and 5 months. Demelin's patient lived only 2 hours, 2 recorded by Humphry, 32 hours and 4 and ½ months, respectively, and the one reported

by Cowan and Ferguson, 2 months. Humphry says length of life is usually not great but in some instances the subjects have reached adult life or even survived to a later period. He cites no cases to substantiate the latter statement and is the only one of the writers mentioned in this paper to intimate that such duration of life is possible. Defect in the interventricular septum accompanying transposition is favorable to the prolongation of life. Patent foramen ovale alone may exert no influence whatever upon the length of life of the individual. Persistent ductus arteriosus is so rarely the only anomaly that it may be regarded as a subordinate lesion; from the nature of the malformation, it is unlikely that any appreciable influence upon the duration of life is exerted thereby.

The pathology of several conditions or processes associated with the lesions under consideration, as cyanosis, polycythemia, clubbed digits, and the usual lack of edema, would furnish a very interesting discussion. As they are common to essentially all forms of congenital heart disease, however, their elaboration does not especially come within the scope of this paper.

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HYSTERECTOMY FOR FIBROIDS OF THE UTERUS*

WITH A REPORT OF 250 OPERATIONS.

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THE great frequency of uterine myomata, and their tendency to produce sterility in many of the women so affected, renders the subject of their proper treatment one which is ever of interest to the practical surgeon, and one from the discussion of which with his colleagues he is almost always able to gather some ideas of value.

According to Bayle, one woman out of every five over thirty-five years of age is afflicted with uterine myomata; and although at first sight this proportion seems inordinately high, I do not think it is altogether improbable. The more recent statistics of McDonald show very nearly as high a percentage. In 175 autopsies on women over 20 years of age, he found 26 cases in which fibromyomata of the uterus were present, making the incident of this disease 14.8 per cent; and if these tumors are found in one out of seven women over 20 years of age, they may be expected to be found with even greater frequency among those only who have passed their 35th year. Moreover it is to be recollected that in routine autopsies, such as those to which McDonald refers, it is by no means unusual for small intramural fibroids to be overlooked, so that as a matter of fact it is by no means improbable that the proportion of one out of seven is slightly below the truth, rather than above it. The relative

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frequency of uterine fibroid is also great. Williams analyzed the histories of 9,227 females suffering with neoplasms of various kinds, in various parts of the body, and found that among these the uterus was the seat of disease in 2,649, or 28.7 per cent.; while of the uterine tumors no less than 883, or 33.33 per cent., were fibromyomatous in character. Beckett in a recent paper reports that of 100 hysterectomies 46 were for fibroid growths, and Swain resorted to hysterectomy for fibroids 31 times out of 50 operations for solid tumors of the uterus and ovaries. It is estimated, moreover, by Williams that nearly one-third of patients with uterine fibroids are sterile, whereas of married women in general only about one-tenth are sterile. It remains, however, an open question whether the sterility causes the formation of fibroids, or whether the fibroids are the cause of the sterility. As Williams states, it may be truly said that maternity and child-bearing are the great enemies of myomata.

The mere fact that a woman has a fibroid tumor of the uterus is in no respect, however, an indication for its removal. In my own opinion no such growth should be removed unless it causes symptoms. What these symptoms are I shall discuss presently. Kelly, nevertheless, states emphatically that he has several times removed uterine myomata merely to relieve the distressed mental condition of the patients, caused by the knowledge of the presence of an abdominal tumor. But it certainly seems to me that if we undertake a serious operation—and hysterectomy is a serious operation, enthusiastic gynecologists to the contrary notwithstanding—for so immaterial a cause of mental distress, we should at least be convinced that the patient's mental distress will be less when she knows that she has no womb, than it was when she possessed a uterus with a harmless tumor in its substance. I say a harmless tumor, because I am thoroughly convinced that a myoma of the uterus which produces no symptoms is as nearly harmless as any pathological change can ever be. I am well aware that some eminent gynecologists, among them Penrose and Noble, have urgently recommended the removal of all such growths at the earliest possible moment, on the ground that they are specially prone to undergo sarcomatous or carcinomatous change; but I am not personally convinced that such changes are so prone to occur. Hirst quotes Olshausen as stating that all the dangerous degenerations taken together (malignant, cystic, telangiectatic, and necrotic) do not affect more than 5 per cent. of all cases. McDonald, in his series

of microscopical studies of 280 cases of fibroid uteri, found malignant changes in only 12, or in 4.28 per cent., of which sarcomatous changes existed in only three cases (*i.e.*, less than 1 per cent.), and carcinomatous associations in eight cases, there being also one case where deciduoma malignum was found. From the carcinomatous list, however, must be deducted two instances of squamous celled carcinoma of the cervix which evidently had no connection with the fibroid growths, leaving only six cases of carcinomatous association. It is to be noted that McDonald speaks very conservatively of these malignant changes, and that while he thinks the sarcomatous changes found are true degenerations, he invariably speaks of sarcomatous "associations." His conclusion is that "while the association of squamous carcinoma with fibroids is accidental, the occurrence of adenocarcinoma may be more or less influenced by the presence of fibroid tumors." Moreover, so great an authority as Bland Sutton makes the assertion that many tumors described as fibroids which had undergone sarcomatous degeneration are in reality tumors which were sarcomata from the very beginning. Hall has recently recorded several instances in which periods of ten, fifteen or twenty years have elapsed after the cessation of symptoms at the menopause, when these fibroids suddenly took on malignant characteristics, and necessitated operation in the patient's old age. So long an interval, however, would make one incline more to the theory that the malignant tumor was an entirely independent growth. Richardson has also recorded somewhat similar cases. If an author, however, searches the literature, as Sturmdorf has recently done, and collects all the disastrous results that have followed non-interference in fibroid disease of the uterus during the last twenty years or more, I acknowledge that it is easy enough to frighten a timid or an inexperienced physician into the idea that uterine myoma constitutes a disease most inimical to life, and one which demands prompt operation for its proper treatment. Roger Williams, nevertheless, considers 1 in 2,000 a conservative estimate for the mortality rate from unoperated uterine fibroids; and if we take McDonald's autopsy figures, and make a corresponding calculation, we shall find an even lower death rate produced in the community by this disease. Among McDonald's autopsy cases of uterine fibroids he considered that the tumor was responsible "indirectly" for the cause of death in only 8 per cent. of the cases. If, then, only 8 per cent.

of women afflicted with uterine myomata die from the disease, it means that in actual figures only 8 per cent. of 20 per cent. out of every one hundred women die as a result of these growths. That is to say only 1.6 in 10,000 is the general mortality among women from this disease. I think, therefore, the conclusion is amply justified that operation is not to be injudiciously recommended.

It is possible, however, to err on the side of ultra-conservatism. This is an attitude of mind well represented by the following extracts from Herman's work on "The Diseases of Women:" In speaking of the indications for operation in a patient whose attention has been attracted by the size of the tumor, but who does not suffer in any way from its presence, he says "No drug has any influence upon the growth of subperitoneal fibroids, nor has electricity. The only effective treatment is surgical. The alternative is letting the tumor alone. Some expert operators have urged that every fibroid should be removed, whether causing trouble or not, on the ground that if it be not causing trouble now it will by-and-by. The decision must rest with the patient. Your duty is to put before her the probable consequences of letting the tumor alone and the probable consequences of having it removed. She must decide."

"What are these consequences?" she proceeds to ask. "Suppose that she lets it alone. Her belly will remain big and it may get a little bigger. It is possible that it may get very big. It is also possible that degeneration of the tumor may set up inflammation, or that it may get incarcerated or adherent in such a way as to interfere with other organs by its pressure. But these things are very unlikely. The chances are that an increase of an inch or two in her waist measurement will be all the trouble that her tumor will give her.

"Suppose that the tumor is removed. Some mishap during the operation may kill her in a few days. This is unlikely, because when the tumor is small and the peritoneum healthy, the operation is easy and safe; but it is possible. In any case the patient will have three weeks in bed, and it will be months before she regains the tone of her nervous system. The days following the operation will be very unpleasant, marked by vomiting, thirst, pain and anxiety. . . . None of these things are desirable. What does she gain by submitting to all this? Nothing but a slightly smaller waist, and security against some contingent but improbable dangers. I think a sane woman will prefer to wait as she is."

It appears to me that the judicious and safe course lies between the two extremes—those of ultra-conservatism and ultra-radicalism. We must, I think, recognize the fact that malignant degenerations or associations do occasionally occur in myomatous growths of the uterus, and that pus-tubes, ovarian cysts, and peritoneal adhesions are uniformly found in no insignificant proportion of patients with such tumors; but on the other hand we should not forget that there are many women, as proved by reliable statistics and by the personal experience of many thoroughly trustworthy observers, in whom fibroids of even considerable size are provocative of no special discomfort, and in whom death finally occurs from intercurrent and entirely independent diseases. Dr. Noble's statement that at least a third of the women, statistics of whose cases he had collected, would have died without operation, I think, is to be accepted with reserve, if he means that their lives were saved by the operation from imminent destruction. All women afflicted with fibroid tumors of the uterus must die sooner or later, and my conviction remains firm that where a fibroid tumor is producing no symptoms the expectation of life is as long, if not longer, without immediate operation than it is when operation is indiscriminately undertaken at that stage of the disease. The life history of this malady is not, so far as I can see, at all comparable to that of ovarian cysts, and the same arguments do not apply for early operation in the one case that are admittedly correct in the other.

Frequently, however, operation is demanded because of the existence of other affections, and while the fibroid tumor is the change which attracts the patient's and perhaps the surgeon's attention, it is not really the prime cause of the symptoms. It is generally admitted that fibroids predispose to affections of the ovaries and tubes; and I think there can be no doubt that such complications are more often productive of symptoms than are the fibroids themselves.

The symptoms for which, in my judgment, hysterectomy is required are almost solely those of pressure, with the exception of those submucous growths which cause excessive hemorrhage. In my experience the hemorrhage alone has rarely demanded operation. The majority of women are so accustomed to the periodical loss of blood that the loss of a somewhat greater amount, or the slightly greater frequency of the bleeding, does not usually alarm them, and they do not consult the surgeon

until pain, which is almost invariably due to pressure, has arisen. It is useless to postpone an operation, when hemorrhage is excessive, in the hope that the menopause will bring relief of all symptoms. While this occasionally happens, it is in my experience, and I think in nearly every one's, extremely exceptional for a tumor which has once become productive of urgent symptoms ever to subsequently subside into an innocuous condition. The menopause is practically always delayed, and is often permanently postponed, by fibroids which have become persistent bleeders.

Although pain, which is, I think, usually the most urgent symptom, is generally caused by subperitoneal fibroids of considerable size, or by those of moderate size incarcerated in the pelvis, yet I have seen cases in which excessive pain was caused by intramural growths of insignificant size. The most prominent symptom in my experience has been increased frequency of micturition; in comparatively few cases have I seen pressure of fibroid tumors of the uterus upon the rectum cause symptoms of different defecation or partial obstruction. I have, however, seen one patient in whom obstruction of the bowels was caused by pressure on the sigmoid flexure by a fibroid locked in the pelvis. Hemorrhoids are a frequent accompaniment, and I think it well to lay stress on this point, as unwary surgeons may operate upon the rectal condition without ever examining the uterus, and fail of a permanent cure because the cause remains. Rectal examination is also a means of diagnosis which I am convinced is too often overlooked. Where small intramural fibroids exist in the posterior wall of the uterus their detection by bimanual examination through the vagina may be impossible, whereas, by drawing down the cervix uteri with a tenaculum while its postero-superior surface is palpated through the rectum, they can usually be discovered.

While pressure on and displacement of the bladder not unfrequently occur, particularly in cases of fibroids intraligamentary in their growth, and although dragging on the ureters may result, I have never seen pressure sufficient to cause obstruction of the uterus with consequent hydronephrosis. Yet in one case, operated upon five years ago, which was complicated by an intraligamentary cyst and adherent appendix, the ureter was injured in separating the cyst from its bed, and death ensued on the ninth day from sepsis.

The form of treatment to be adopted for patients suffering

with this disease should be almost invariably operative, unless, as was mentioned before, the growth produces practically no symptoms. Such patients, however, should be subjected to periodical examination by the surgeon, and as soon as symptoms are manifest, or if the tumor is found to be rapidly increasing in size, operation should be no longer postponed. In many instances, moreover, as has already been stated, certain complicating conditions, such as pyosalpinx or an ovarian cyst, may render immediate operation advisable, even although the fibroid tumor *per se* presents no symptoms worthy of attention.

While some few cases of fibroids have been benefited by medical measures, such as attention to hygiene and the administration of drugs, yet for the most part in my experience, those tumors which caused symptoms necessitated radical operation for their cure. On several occasions patients have been sent to me with profuse bleeding from intrauterine or submucous fibroids, and some of them have been benefited temporarily by rest in bed and the internal administration of ergot. These cases were subsequently operated upon, and the future welfare of the patient secured by radical measures. It is always well to bear in mind that patients with uterine fibroids are more or less anemic and toxemic, and that therefore operation should not as a rule be undertaken immediately upon their admission to the hospital. They should be well fed, blood tonics should be administered, the heart, kidneys, and intestinal tract should be regulated, and the patient should become thoroughly accustomed to her surroundings, before any operation is undertaken, unless some complication renders immediate operation imperative. It is above all important that attention be paid to the heart. The great frequency of myocarditis and arteriosclerosis, apparently directly caused by the fibroid growths, is well known; and to sudden heart failure, to pulmonary embolism, or to apoplexy, may no doubt be attributed many a postoperative death occurring at the beginning of an apparently normal convalescence. The average duration of life after operation in 19 fatal cases in my list has been five and one-half days, and while some of these deaths may be attributed to shock and exhaustion, and a few to peritonitis, yet I am convinced that in a number death was caused by pre-existing cardiac and cardiovascular diseases.

In selecting the special form of operative treatment to be adopted, I appreciate the great necessity for careful and con-

scientious study and examination of the conditions present. Although there are undoubtedly cases in which there is only one large fibroid, yet, according to my own experience, they are so extremely rare as to make them of little consequence in deciding upon the operation to be employed; besides which fact their differentiation from cases with multiple fibroids, is, before the abdomen has been opened, almost impossible, since painstaking search of the exposed uterine surfaces so frequently reveals small fibroids entirely undetected theretofore. The experience of Haultain, recorded in a recent paper, accords with my own, and with that of the majority of surgeons. Among 63 simple fibromyomata of the uterine body he found 54 were multiple, and only 9 single. McDonald's figures are 110 single and 170 multiple, out of a total of 280. Yet Engeström, among 100 laparotomies for fibroid diseases of the uterus, found multiple myomata in as few as 37 cases, while in as many as 63 only a single tumor was present. Such an experience I am sure is exceptional.

The Apostoli or electric treatment of uterine myomata can, to my mind, be condemned without reserve. Electricity used for the purpose of controlling the hemorrhage of a fibroid is, in my judgment, ill-advised and may cause the patient to lose what may be precious time. To use electricity as a temporary measure until the patient entertains the proposition of operation is, to the writer's mind, only dilly-dallying. Dr. B. C. Hirst in his text-book states that during a period of three years, while he was a member of a committee of the Philadelphia County Medical Society appointed to investigate this treatment, not a single case was presented to the committee in which a tumor had been reduced in size by the Apostoli treatment.

Curettement is occasionally of value in those cases of sloughing fibroids of the submucous variety in which the object is not so much the actual removal of the fibroid as of the necrotic tissue; it is a procedure which I have sometimes also found of value in those patients who are much debilitated by continuous bleeding and slightly septic as a consequence, and in whom radical operation at that time was evidently inadvisable. By the removal of the septic endometrium, as well as perhaps the outer and more vascular surface of the fibroids, the bleeding is very much lessened or altogether checked for the time being, and the general condition of the patient becomes so much improved as to justify the radical cure of the disease at a later period. In a patient

aged 86 years, with a sloughing fibroid, recently under my care, her general health improved so much after being twice curetted, that I finally did a vaginal hysterectomy with success.

With the various forms of intrauterine applications, such as iodine and carbolic acid, I have had no experience whatever, and cannot think that they can be productive of anything but harm. Montgomery narrates that in his early experience he injected tincture of iodine into the uterine cavity with the hope of relieving a patient, with a large fibroid tumor, of frequent attacks of bleeding. "Almost before the syringe could be withdrawn the patient complained of tasting the drug, and within a few moments she had a most violent attack of pulmonary edema, which threatened her life, and from which she recovered only after a protracted illness." For my part I have given no attention to these methods, knowing that they were merely palliative and that under no circumstances could they conserve the best purposes as regards the patient's welfare.

Castration for the relief of hemorrhage in fibroid tumors of the uterus, introduced in 1876 by Trenholme and Hegar, is to my mind as irrational and unsatisfactory a procedure as are castration and vasectomy for enlargement of the prostrate gland. Hirst says that oophorectomy "may be expected to accomplish satisfactory results in checking hemorrhage and effecting a reduction in the size of the tumor in 75 to 90 per cent. of suitable cases." But when, as Dr. Hirst further observes, the many cases which are unsuitable have been eliminated, when the many dangers and complications of this operation in patients with myomatous uteri are considered, and when the frequent possibility of removing every scrap of ovarian tissue—upon which success depends—is recollected, we perceive how very much the field of this operation is narrowed. In a patient with a large fibroid and very anemic, in whom I removed both uterine appendages, fearing that hysterectomy at the time would be too much for her, I had, before convalescence was established, to do a supravaginal hysterectomy to save the woman from bleeding to death. Ligation of the uterine arteries, or of all the arteries which it is possible to ligate in connection with the female pelvic organs, is a method of treatment for fibroid tumors that has met with success in some hands. Owing to the extremely free blood supply I feel sure that this measure, even in the hands of the most experienced operators and careful observers, cannot be other than temporary, and the results have in fact been most disappointing.

Myomectomy is an operation which may be considered ideal in conception, yet I feel that in a large percentage of cases it would be impossible to employ it to advantage. Careful and painstaking examination of fibroid uteri is so sure to reveal small myomatous nodules usually interstitial in character, which escape a more cursory examination, and the probability is so great that these small growths will subsequently enlarge and cause a renewal of symptoms after the removal of the most easily detected myomata, that I have in my own practice limited the performance of this operation to a very small number of cases. Hubbard has recently reported the case of a woman who, after myomectomy, had two pregnancies. The first child was delivered with difficulty by podalic version, and died very soon afterwards. For the second labor Cesarean section was done, and it was then positively determined that the dystocia was due to the presence of a subperitoneal fibroid of small size, which had evidently grown since the operation of myomectomy, as well as in no small degree to the torsion in the long axis of the uterus caused by the scar of the previous myomectomy. While these, therefore, are the principles which I think should guide us in the selection of this operation, yet in young women, or in those for whom subsequent child-bearing is specially desired, it is well to stretch a point, and to ignore some of the limitations which naturally encumber the operation of myomectomy.

I find that among the 250 operations for uterine fibroids herewith reported, I have considered that of myomectomy applicable in only thirteen instances. Eleven times I enucleated the tumors by the abdominal route, and twice by the vaginal, the growths in the latter instances being large submucous tumors with no distinct pedicle. In a fourteenth case, where the submucous tumor was pedunculated, I removed the mass by means of Downes' cautery. I have not included in this report the large number of uterine polypi which it falls to the lot of the hospital surgeon to treat. All of these patients treated by myomectomy recovered, and, so far as I am aware, none have had a recurrence of the growths. In two of the patients treated by abdominal myomectomy I performed ventrosuspension of the uterus at the same operation, and in one of these two I removed a chronically inflamed appendix as well. In a third case of abdominal myomectomy I removed an acutely inflamed appendix and performed Mann's operation of intraperitoneal shortening of the round ligaments; while in a fourth case besides

the performance of myomectomy and intraperitoneal shortening of the round ligaments, I did a posterior jejunostomy for the relief of pyloric stenosis, and in a fifth case I performed nephropexy for floating kidney after removing several myomata from the uterus. As a rule I do not countenance such shot-gun surgery, but when a patient is in good condition, and is eagerly desirous of having all her maladies treated at one operation, the surgeon's temptation may be too strong to resist. Recovery as already mentioned, was in all these cases uneventful.

Vaginal hysterectomy for uterine fibroids is an operation which I have employed only three times. Apart from the physical impossibility which sometimes exists of removing fibroid uteri through the vagina, there are other reasons which make the abdominal route much preferable. One of these is the fact that myomatous uteri are so frequently found in women whose pelvic outlet is very small and contracted, either because they have borne no children at all, or because they have borne at the most only one or two children and these probably at a period many years before. But a still more important reason, it seems to me, is the very large number of such cases in which adnexal disease or other intraabdominal complications co-exist. Twombly asserts that tubal disease is present in 50 per cent. of women with myomatous uteri; and it is generally admitted that uterine fibroids predispose to the rupture of pus tubes. Moreover, by far the largest number—70 to 90 per cent.—of fibroids arise from the corpus uteri, as distinguished from the cervix, and tumors growing towards the cavity of the uterus are notably fewer in number than those which grow beneath the peritoneum. Among my own series of 250 cases, no less than 34, or 1 in 7, were complicated by gross disease of the adnexa such as pyosalpinx, hydrosalpinx, tuboovarian cysts, ovarian cysts, and parovarian cysts while in many more patients chronic salpingitis and oophoritis were present. For these reasons, therefore, it has always seemed to me that vaginal hysterectomy for fibroids of the uterus is distinctly inferior to hysterectomy by the abdominal route. I am happy to say that all three of my patients made good recoveries.

Abdominal hysterectomy may be either supravaginal or total—hysteromyomectomy or panhysterectomy as the respective operations are now usually termed. Of these I have generally adopted the supravaginal amputation of the uterus, as it is both an operation which I believe is attended by a lower mortality

rate, and is also easier of execution in the majority of instances.* The shorter time required for its performance, with the lessened shock entailed, as well as the less likelihood of vaginal prolapse following the supravaginal operation, are also factors which to my mind render its adoption usually more to the patient's interest than the employment of panhysterectomy. This latter operation, however, I have employed fourteen times for fibroid tumors, with one death, a mortality of about 7 per cent. The fatal case, in which death occurred on the seventh day, can, I think, be as much attributed to constitutional depression as to the operation itself. I do not mean by this to say that the patient would have died within seven days if no operation had been performed, but what I do think is that any operation for the removal of her fibroid tumors would have been quite as apt to be followed by a fatal issue as was that of panhysterectomy. It has been my principle never to employ this operation unless it seemed distinctly easier of execution, and thus to shorten the time of the anesthesia and lessen the shock to the patient. It has therefore been employed mainly where the myomatous growths extended so far down in the pelvis and so close to the cervix, whether they involved this part of the uterus or not, that it would have been difficult if not impossible to find any suitable line of cleavage for performing a supravaginal amputation. In one of my cases of panhysterectomy secondary hemorrhage occurred from the slipping of the ligature, and the artery, which was in the right pedicle, was ligated on the day after the operation. Recovery of the patient was uneventful thereafter. In two other of my panhysterectomy cases the operation was complicated by the presence of pyosalpinx, and removal of the whole uterus seemed indicated to minimize the danger of rupturing these abscesses. In still another of these cases I adopted this operation because of the presence of a parovarian cyst, which was so adherent to surrounding structures in the pelvis that total hysterectomy simplified the operation.

Supravaginal hysterectomy I have employed for this condition 219 times, with a total of twenty deaths. I regret very much not being able to report a lower mortality than 9.13 per cent. for the whole series of hysteromyomectomies, but I am happy to state that my record has improved with the lapse of years—a fact which may no doubt be partially due to an increase

* Bland Sutton quotes Sampson as stating that among 156 panhysterectomies performed at the Johns Hopkins Hospital, the ureter was injured n no less than 10 cases

of experience in selecting suitable cases for operation, and to an added skill in performance of the operation, but which is also due, I venture to think, very largely to other factors not so much within the control of the individaul surgeon. I refer more especially to the habitual resort to earlier operation, before the patient is hopelessly weakened by long-standing pain and hemorrhage, and before the cardiovascular system has become irretrievably diseased by the toxemia frequently attendant upon these conditions; and another factor which I think is of some importance in improving the mortality rate during the last few years, is the almost universal abandonment of the electrical and injection treatments, which, as all of us know, who have subsequently operated on patients treated by such means, renders inflammatory adhesions and other intraabdominal affections so very much more serious than would otherwise have been the case. Besides the factors already mentioned, I think the general adoption of intravenous saline infusion during the last four or five years has added very materially in reducing the death list after this as after all other operations accompanied by shock and sometimes attended by hemorrhage and sepsis. Whatever be the cause I am happy to say that among the last 105 supravaginal hysterectomies which I have performed, I have had only three deaths, a mortality rate of 2.85 per cent., while among the last 48 such operations there has not been a single death. It must be granted that cases coming into a general hospital present more serious aspects than those going into special hospitals; therefore, a higher mortality must be expected.

In performing any operation for hysterectomy for these conditions, I have always aimed to preserve the ovaries, or one ovary or even a portion of one ovary, when it seemed probable that the retention of such structure would be of any advantage to the patient. In a woman who has reached the climacteric, or who would already have passed it, had she not had uterine fibroids, I have not as a rule hesitated in removing both ovaries; and in younger patients where the ovaries were distinctly diseased, or where the tubes or the uterus were so distorted as to render the dissection of the ovaries or even of one, tedious and difficult, I have usually deemed it wiser to remove them than to unduly prolong the operation for the preservation of an organ which even when dissected free might be found to be functionless from disease. Where one of the ovaries is cystic I have prac-

tised excision of the cyst or cysts. I make it my practice to leave one or both ovaries prior to the climacteric if not diseased. While many operators do not regard this of any moment, nevertheless, my experience has taught me to the contrary, and therefore, I have no hesitancy in setting forth my views plainly. The question of removal of a healthy appendix and of going on an excursion to locate the gall bladder, and if stones are found, to remove them, I am strongly opposed to. I believe the best surgery is the surgery that deals with pathological lesions only, and leaves the remaining part of the abdominal cavity for subsequent interference should occasion arise to warrant it.

As regards degeneration of the myomatous growths, my records show that cystic fibroids were found in two cases, and in one instance a calcified fibroid. There was only one patient in whom the chief fibroid growth was intraligamentary in character. In one patient, the fibroid, which was large, was twisted on its long pedicle.

Pyosalpinx was present in nine of my cases, and in two of these both tubes were converted into pus sacs. Among these nine cases of pyosalpinx two deaths occurred, on the fourth and seventh days, respectively, the last case being one of the patients with double pyosalpinx.

Hydrosalpinx was present in three patients, all of them recovering.

There were tuboovarian cysts in two patients, both recovering.

There were 18 ovarian cysts, among which number are included 2 instances of dermoid cyst, 1 instance of an ovarian cyst with a twisted pedicle, 5 intraligamentary cysts, and 1 ovarian cyst complicated by extrauterine pregnancy. In both cases of dermoid cyst the appendix was involved in adhesions and was removed. Among these 18 cases complicated by ovarian cysts, only one death occurred, that being in a patient with an intraligamentary cyst on the right side, with very many and dense adhesions, from which the vermiform appendix was also removed, and whose right ureter was accidentally injured in dissecting the cyst wall from its bed. Death in this instance occurred from sepsis on the ninth day after operation.

Among the whole series of 250 cases the appendix was removed 34 times, being actually inflamed in one instance only, and its removal in the remaining 33 cases being indicated either because the patient had suffered from previous acute attacks, or

because it was involved in the pelvic disease. There were two deaths among the cases where appendectomy was performed—one in the patient with ruptured ureter already referred to, and the other in a patient with very many and dense adhesions throughout the pelvis.

In two cases a lipoma was removed from the breast, and in one patient a similar tumor from the arm. Although one of the patients with mammary lipoma had a somewhat complicated hysterectomy involving removal of a dermoid cyst of the ovary and the vermiform appendix, yet no deaths occurred in this series.

In one patient upon whom I did a supravaginal hysterectomy intestinal obstruction occurred three days after operation, and was caused by a knuckle of small bowel becoming adherent to the right stump. Operation for the obstruction was followed by uninterrupted recovery.

In three cases the uterine tumor had grown to such immense size before operation that it caused separation of the recti and a ventral hernia. One of these patients, in whose case the operation was long and tedious on account of the numerous adhesions and the large ventral hernia, unfortunately succumbed on the second day after operation.

Besides the causes of death already mentioned, there occurred in my series of operations one death on the tenth day from catarrhal pneumonia, one from peritonitis, one from shock following hysterectomy for fibroids causing intestinal obstruction, and one death from secondary hemorrhage. In only two cases did secondary hemorrhage occur. In the first, a patient operated on December 31, 1903, the abdomen was opened the following day, and the hemorrhage checked; but the woman gradually failed and died of asthenia on January 3, 1904. In the second patient, already referred to, operated on November 16, 1904, by panhysterectomy, the ligature slipped from the right pedicle on the 17th; I opened the abdomen promptly, ligated the bleeding artery anew, and her recovery was uneventful.

Prolonged operation, that is to consume more than three-quarters or at best an hour to perform a fibroid operation, is attended by increased danger. Pulmonary edema or pulmonary embolism may be more often looked for under these circumstances when we consider the importance of the anesthesia, which is usually brought about by the troublesome ether or the dangerous chloroform.

I have never resorted to catheterization of the ureters in either abdominal or vaginal hysterectomy, yet I appreciate that this practice is advocated by some very good men, among them Dr. Howard Kelly. The fact that in 250 abdominal hysterectomies the ureter has been injured but once, when it could not have been avoided had there been a catheter in, on account of adhesions, is one of my arguments against the use of this measure. Another, and equally important argument against it is the risk of infection of the kidneys from below upwards, by this instrumentation.

A low hemoglobin, a count of 20, does not deter me from hysterectomy in a patient who is bleeding and in which any attempt to control the hemorrhage other than by tamponing would mean a loss of time. I have never had a death in hysterectomies under these conditions.

In conclusion I may state that my experience with uterine fibroids has led me to hold the following opinions:

That fibroids of the uterus do not require removal unless they are productive of symptoms; but that when they do become symptom-producing they should be removed promptly, before the patient has been weakened by toxemia, hemorrhage or sepsis.

That abdominal supravaginal hysterectomy is the operation to be preferred in the vast majority of cases.

That myomectomy is applicable only to younger women in whom the tumors are few in number and subperitoneal in character.

That panhysterectomy is to be employed only when intraligamentary growths, whether uterine or ovarian, render the performance of supravaginal amputation difficult or dangerous.

That the ovaries or a part of one ovary should be preserved in every woman who has not reached the age of the menopause, unless they are distinctly and indisputably diseased, or unless their retention would needlessly prolong and complicate the operation.

It may be urged that in the use of large clamps a mass ligature is employed; even so my results have been satisfactory. I am a great admirer of neat surgery, which is accompanied, of course, with strict cleanliness; on the other hand, I do not think much of fancy surgery, to which oftentimes can be attributed a mortality. I make it an invariable rule to drain when there is oozing in pelvic operations which cannot be controlled by

catgut sutures which do not entail risk to the ureters. One of the ancient principles of surgery is drainage, and he who applies it well, cures well. I regard it as bad practice to allow much, if any free blood to remain in the peritoneal cavity with the belief that the peritoneum will dispose of it. My knowledge of the bacteriology of peritonitis tells me that even a small blood clot, while sterile at the onset, does not necessarily remain so; therefore, the patient is exposed to the risk of peritonitis, while if the proper drainage is used this risk is certainly minimized, if not removed altogether.

A word concerning the different operative procedures required to meet the indications in the different types of fibroid referred to in this paper.

The supravaginal is the one most practised. In this operation, however, instead of transfixing the broad ligament on either side, tying the ovarian and uterine vessels separately, I quite often use large clamps, cut and tie; this makes a short operation.

In the operation of complete removal of the uterus by the abdominal route, I invariably use large clamps. In complete removal where the uterus is quite large and the pelvis deep and small, making it difficult to reach the uterine arteries, I make a supravaginal amputation, then grasping the cervix with a Volsella forceps cut it out of the vagina with a pair of scissors; this makes a rapid operation. I believe it is bad practice to consume two or three hours in any abdominal operation, particularly so simple a one as are the majority of hysterectomies. In a few cases I have had occasion to bisect the uterus (after Kelly) in order to obtain room to work easily and rapidly.

In the vaginal operation I invariably use Pryor's vaginal clamps. I have injured a ureter in but one case of abdominal hysterectomy, which I report in this series.

CONGENITAL FETAL CYSTS OF THE NECK OBSTRUCTING LABOR.

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(With one illustration.)

THE following case of congenital fetal cyst of the neck (hygroma cysticum congenitum colli, ymphangioma congenita) that proved an obstruction to labor, came under my observation some time ago. The history of the patient was as follows:

Mrs. C. H., II-para, 26 years of age, a patient at the St. Louis Female Hospital, had been delivered of a nine-pound normal child three years previously. Her pelvic measurements were interspinous, 28 cm.; intercristal, 29 cm.; intertrochanteric, 32 cm.; diagonal conjugate, 12¼ cm. On July 11, 1899, about the expected time of her confinement, labor pains set in. The first stage of labor lasted 14 hours, but even after the cervix was completely dilated, the head remained deflected to the side of the pelvis and refused to engage. A high forceps application was made by the superintendent, Dr. N. J. Hawley, and after considerable difficulty a living child was extracted. It was unusually large, weighing 9¾ pounds, and showed upon the right frontal eminence a small scalp wound. Although in other respects perfectly normal, there was, in the region of the left sterno-cleido-mastoid, a fluctuating tumor the size of a man's fist. It extended from the clavicle to the mastoid process and from the ligamentum nuchæ behind to the great vessels of the neck in front. Apparently it lay directly beneath the skin, but the latter was movable over the tumor. It also gave the impression of being multilocular. On the eighth day after delivery an attempt was made to empty the contents of the cyst with a syringe, but in spite of several punctures only about one ounce of fluid could be removed. The contents of the cyst were straw-colored, contained about 7 per cent. of albumin and clotted into a solid jelly-like mass within ten minutes after it had been withdrawn. A few red blood cells were found microscopically. As the cyst did not in any way interfere

with the development of the child, further treatment was postponed.

On March 14, 1900, when the child was eight months old, the mother again entered the hospital, and at her special request, although the cyst had not increased in size, I undertook its removal. The operation proved more difficult than I had anticipated. The cyst was multilocular and its coat was found to be intimately connected with the cervical fasciæ. It was firmly adherent to the clavicle, and in attempting to free it anteriorly the fibrous sheath of the great cervical vessels was slightly torn and these vessels lay exposed directly beneath the finger. In view of these circumstances, it was decided not to remove the entire cyst-wall. The wound was then closed and a small gauze drain inserted. The child made a good recovery. There was no evidence of postoperative paralysis. During the following summer the child developed a tubercular enteritis and died in the autumn of general tuberculosis. The post mortem showed no evidence of any malformation or cystic degeneration.

The tumor which was removed contained a large number of cavities varying in size from a hazelnut to a walnut, and filled with a semi-gelatinous fluid. Dr. E. F. Tiedemann, who was kind enough to make the microscopic examination, reported the tumor to be a typical lymphangioma.

Varieties.—In the consideration of these fetal cysts of the neck we must differentiate several varieties:

(1) The cyst may be, as Ballantyne[1] points out, of the nature of a spina bifida in the cervical vertebræ. Doubtless some of these cases are really instances of occipital meningocele.

(2) Branchial cysts occur at the same point in the neck as do the fistulæ. They are due to the persistence of some of the epithelium lining the branchial clefts or grooves after the clefts themselves have closed. There are median cysts lying above the level of the hyoid bone known as sublingual dermoid cysts, while others are lateral, supra- or infra-hyoid. Such cysts as a rule consist of only one cavity, usually round, lie superficial and are lined by stratified squamous epithelium. Their walls at times contain hairs, hair-follicles and sebaceous glands. Some develop after the birth of the child. They belong to the general class of dermoids.

(3) True blood cysts, whose origin is uncertain, are also semi-occasionally found in this region.

(4) Cystic enlargement of the thyroid may cause a congenital swelling in the neck of the child. They are a variety of congenital

struma and should be looked upon as instances of fetal disease rather than embryonic malformation.

(5) More frequent than any of the above, but still an exceedingly rare condition (Ballantyne finds only one case in 327 instances of antenatal pathology), is the so-called hygroma or congenital lymphangioma of the neck. It is to this class that the case above reported properly belongs. These tumors are often deep-seated and even if superficial are apt to have diverticula passing far in among the important vessels of the neck. Usually they are of irregular outline and elastic consistency and contain a considerable number of cyst cavities. The lining membrane of the cyst consists of an endothelium similar to that of a lymphatic vessel, and the contents are generally clear serum, at times brownish, as a result of hemorrhage into the cyst. The presence of a large percentage of albumin (7 per cent.) was determined in my case.

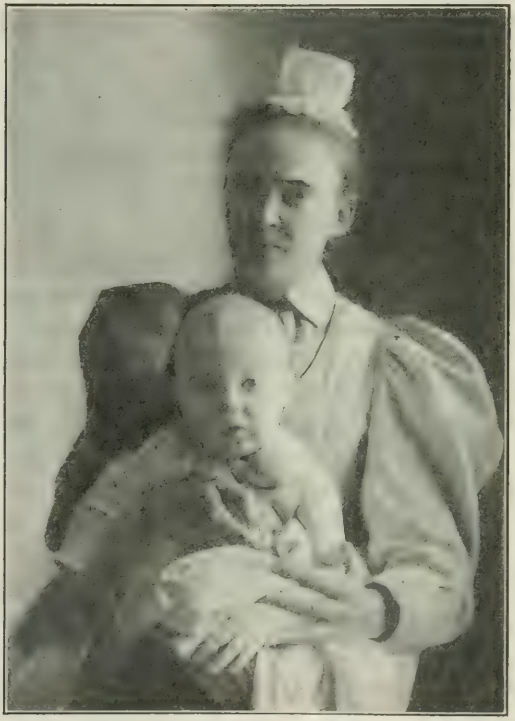
Etiology.—The etiology of these lymphangiomata is still a matter of considerable speculation. Some writers such as Kothe[2] think they should be classed as true neoplasms. In support of this contention are brought forward their frequent association with nevi and other congenital tumors, but above all the fact that they grow during post-natal life (Walther[3]). In my case I could not determine any appreciable increase in size during the eight months that elapsed between delivery and operation.

Ballantyne, on the other hand, considers that there are no sufficient reasons for looking on these cysts as of the nature of an angioma. He believes the only rational theory is that proposed by Lannelongue and Menard,[4] that they are due to an anomaly of the lymphatic system and are therefore closely related to the fetal disease known as general cystic elephantiasis.

Finally we have the theory of von Winckel,[5] that these hygromata are produced by traction on the part of amniotic bands and stasis in the muscular tissue lying at the base of these tumors. As strong evidence of the correctness of his views, von Winckel emphasizes the frequency with which are found, in these cases, other malformations due to presence of amniotic bands, and the fact that these cysts often extend beyond the region of the neck and back and encircle at times the head, at times the thorax. Furthermore, instances of spontaneous cure are recorded, which is inexplicable on the basis of a neoplasm. Which theory is correct it will require further investigations to determine; but the bulk

of the evidence thus far rather points to the correctness of von Winckel's views.

Diagnosis.—The ante-partum diagnosis of such a tumor of the neck is usually impossible. It was not made in our case, and where delivery is spontaneous it will usually be overlooked. When, however, an insurmountable difficulty to labor presents itself, an examination under narcosis by the introduction of the entire hand will readily explain the cause of the obstruction.



Lymphangioma Congenitum Cysticum Colli. Photograph taken when child was eight months old.

Obstetrical Complication.—In the majority of cases these cysts are not of sufficient size to more than retard the progress of labor. Where the cysts are located in the posterior triangle they seem to cause more difficulty in the delivery of the child, for of eighteen of such cases none were born alive, whereas of sixty cases of cysts situated anteriorly, fifty-six children were saved. Not merely the size of the tumor, but its consistency, and as just stated, its location,

influence the difficulty of delivery. Von Winckel reports a case of double-sided tumor in which the child was born spontaneously. Strassmann[6] dmonstrated a child with bilateral cystic hygroma, 38 cm. and 23 cm. in diameter, that through the pressure of these tumors had been converted into a fetus papyraceus.

Obstetrical Management.—What course to pursue in the delivery of these children is often very difficult to decide. Where labor does not progress as it should, a careful application of forceps in head presentations and of manual extraction in breech cases, is indicated. Occasionally the cyst can be so rotated as to lie in the hollow of the sacrum and delivery thus be rendered feasible. At times, just as in hydrocephalus, the cyst ruptures in the efforts of extraction. The puncture of the cyst, care being taken not to go too deep, is justifiable in a few instances and does not invariably lead to the death of the fetus. Strassmann reports a case in which 800 c.c. of clear fluid were removed by such a procedure.

Treatment.—We come now to the consideration of the treatment of these cysts after birth. As in my case, the child often experiences not the slightest danger or inconvenience from the tumor, and, as cases of spontaneous cure are reported, it would seem advisable not to do anything for a while. When desired or deemed proper, the operative removal of the tumor can usually be effected. It is, however, at times associated with considerable difficulty and even danger, owing to the proximity of large nerves and blood vessels. In my case the carotid sheath was found to be directly involved in the cystic tumor and was opened in the attempt to remove the latter. Since there is apparently no danger of a return of the condition, there is no necessity of a radical operation, and such portions as are connected with important structures can be left intact. Mere puncture usually gives no relief, partly owing to the occasionally gelatinous character of the fluid, partly because of the multiplicity of the cysts. Ballantyne suggests opening the cyst, breaking down the septa between the loculi, stitching the cyst wall to the end of the skin incision, and draining the cavity thus prepared. Doubtless this is the safest procedure in the majority of cases.

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5. F. von Winckel: Ueber Menschliche Missbildungen, *Samml. Kl. Vort.* No. 373-4.

6. Strassmann: *Gos. f. Geb. u. Gyn. zu Berlin,* 26 *Jan.* 1899.

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HEMORRHAGES IN ECTOPIC PREGNANCIES.*

BY

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HEMORRHAGE is a symptom that is found in all cases of ectopic pregnancy that are not operated upon before bleeding occurs. One symptom cannot well be considered without taking up the subject somewhat generally, but the amount of time will not permit of much consideration of the subject in detail.

Varieties of ectopic pregnancy:

Primary..... { Tubal / Ovarian

Secondary..... { Abdominal / Broad ligament

¶ Pregnancy may be present simultaneously in the uterus and tube—Simpson (AMER. JOUR. OBSTET, 1904) has collected 113 such cases. Cases of double tubal pregnancy are on record. Nearly all cases of ectopic pregnancy are tubal and we will consequently limit the discussion to this variety:

Frequency,—Eight Chicago hospitals—St. Luke's, Wesley, Mercy, Michael Reese, Provident, County, Augustana, and Woman's—reported 56 cases last year. Edgar states that the frequency has been estimated at one ectopic in from 500 to 1,000 normal pregnancies. Tubal pregnancy may occur in the ampullar, the isthmic, or the interstitial portion of the tube. The former two are common. The last is very uncommon, and differs so much from the others that it will not be discussed here. The ampullar variety is probably somewhat more common than the isthmic. Pregnancies in the ampullar portion tend to terminate by abortion into the abdominal cavity. The isthmic variety nearly always terminates by rupture into the abdominal cavity.

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It is evident, therefore, that these two varieties vary greatly in symptomatology and diagnosis and consequently require to some extent separate consideration.

Hemorrhages in tubal pregnancy are external and internal. External hemorrhage is from the decidua that forms in the uterus in all cases of tubal pregnancy. The bleeding results from partial or complete separation of the uterine decidua from the endometrium. This usually occurs at about the time rupture of the tube or abortion takes place. Hemorrhage from the uterine decidua usually occurs from five to eight weeks after cessation of menstruation. The so-called "delayed menstruation" is, however, not a reliable diagnostic symptom in tubal pregnancy, as the hemorrhage may appear before or at the time for the regular menstruation. The amount of external hemorrhage is not large but it often lasts for weeks. It is frequently intermittent and often brighter in color than the menstrual flow. It usually stops after removal of the pregnant tube. Curettage of the endometrium usually diminishes but does not stop the bleeding.

Internal hemorrhage is chiefly due to either tubal abortion or rupture of the tube. Rupture of the tube is usually considered to be more common than tubal abortion, but in my experience tubal abortion occurs about five times as often as rupture. In both conditions one always finds a large amount of blood about the amniotic sac and chorionic villi. One should remember that in tubal pregnancy a decidua forms in the tube also, and that chorionic villi are always present. In tubal pregnancy the tubal wall takes on little or no hypertrophy, and thus differs decidedly from the uterus in a uterine pregnancy. The development of the decidua and especially of the chorionic villi without a compensatory hypertrophy of the tube is the chief primary factor in the cause of tubal hemorrhages in tubal pregnancy. The distention of the tube is due more to repeated hemorrhages about the amniotic sac than to increase of tissue. These repeated hemorrhages are said to be due to rupture of small vessels by traction as a result of distention and encroachment of the villi upon and possibly into the blood vessels. The intermittent colic-like pains in the region of the tube which always antedate rupture or abortion, are probably due to repeated hemorrhages and not to contractions of the tube. The thinned out muscle and absence of muscular hypertrophy would favor this opinion. Intratubal hemorrhages are always found in

cases operated upon before rupture or abortion occurs. Whether the tube aborts or ruptures seems to be determined chiefly by the location of the pregnancy; the escape occurs along the route of least resistance.

Tubal Abortions.—The hemorrhages are usually intermittent and consequently pelvic hematoceles are firmly separated from the general peritoneal cavity by adhesions and round cell infiltration. The amount of bleeding varies much in different cases and is seldom dangerous in quantity. Tubal abortions usually occur between the fifth and eighth weeks. The hematocele is usually more pronounced on one side but often extends across the pelvis. It frequently produces a bulging in the posterior fornix, and generally displaces the cervix forwards and upwards against the pubes, a displacement that is nearly diagnostic.

The symptoms of tubal abortion are: (1) Intermittent colic-like pains, referred to the side affected; (2) External hemorrhage, as described above; (3) The symptoms of a pelvic peritonitis, which occurs after adhesions and round cell infiltration takes place. The temperature at first is normal or slightly subnormal, but it soon becomes elevated and usually varies from 99° to 102°. The cause of this elevation is not definitely known; but it is probable that it is chiefly caused by migration of bacteria through the intestinal wall. Fainting is uncommon in tubal abortion, but a feeling of faintness is present in some cases and absent in others. The amount of bleeding is usually not sufficient to produce marked symptoms of concealed hemorrhage. Blood examinations will usually be negative at first or show changes of moderate secondary anemia. Later, however, leucocytosis is always present and is penerally proportionate to the febrile disturbance. The white count usually varies from eight to fifteen thousand.

Tubal Rupture.—The tube ruptures chiefly on account of its distention, which causes the tubal wall to become very thin, especially in places. In some cases the pregnancy is found apparently in the tubal wall to one side of the tubal canal. Extension of chorionic villi into the tubal wall also tends to diminish its strength, and is an etiologic factor in rupture. As in tubal abortion, the distention is due more to hemorrhages about the amniotic sac and villi than to increase of tissue from the gestation. In cases of rupture, the amount of hemorrhage is nearly always much larger than in tubal abortions, is always

serious and is occasionally fatal. The rupture may occur into the broad ligament but usually is into the general peritoneal cavity. Rupture of the tube is nearly always attended by very severe pain. Fainting frequently occurs and a feeling of faintness is always present. The blood usually extends into the general peritoneal cavity, as the hemorrhage is so acute that adhesions do not form to protect the general peritoneal cavity as in cases of tubal abortion. Symptoms of concealed hemorrhage are always present. Shock is a constant occurrence and is chiefly due to loss of blood, but may be partly the result of a foreign body (the blood), in the peritoneal cavity. A hematocele may form later and is more generally distributed than in cases of tubal abortion.

Blood examinations will at first show a diminution in the number of red cells and a low hemoglobin index. These will continue to diminish as long as the hemorrhage continues, and the diminution will be proportionate to the amount of blood lost. Repeated examinations may finally show a gradual increase in the red cells and hemoglobin, and this will indicate that the hemorrhage has ceased. If an hematocele forms the white cells gradually increase and a leucocytosis soon appears as in tubal abortions. The temperature at first is subnormal but soon after the hemorrhage ceases it becomes normal and is then found to be elevated. After adhesions and round-cell infiltration occur the symptoms and findings often simulate peritonitis.

The diagnosis of tubal pregnancy is not so easily made as the literature would indicate. It is probably a conservative statement that 25 to 50 per cent. of tubal pregnancies operated upon are not detected until after the abdomen is opened. It is impossible to estimate the large number of tubal pregnancies that are not diagnosed and terminate in complete spontaneous recovery. Most cases of tubal abortion will finally terminate in recovery or will leave only small vestiges of the disease. The hemorrhage from the uterine decidua is often mistaken for a delayed menstruation or an early abortion. Many of the cases are accompanied by a history of an effort to interrupt pregnancy. The history of colic-like pains in one side is a valuable diagnostic symptom. The presence of a swelling to one side of the uterus will often aid in a differential diagnosis.

Tubal pregnancy is so common that all cases of supposed pregnancy should be examined early in gestation with a view to the possibility of its existence. Careful examination should

detect nearly all cases of tubal pregnancy before abortion or rupture occurs. It is often difficult to distinguish between an irregularly developed intrauterine pregnancy and one in a tube without the aid of an anesthetic. In cases of tubal abortion, especially when efforts have been made to produce a miscarriage or when curettage has been done for a supposed uterine abortion, it is difficult and often impossible to exclude salpingitis without an abdominal section. The clinical history and objective signs, including temperature records, blood findings, etc., are occasionally the same in tubal abortions and salpingitis. In cases of rupture one should have no difficulty in making a diagnosis when seen early, or if an accurate clinical history is obtainable.

The diagnosis of a pelvic hematocele is not always easily made. A hematocele is so seldom due to other causes that one is justified in diagnosing all pelvic hematoceles as ectopic pregnancies. One may mistake pelvic hematoceles, especially when due to tubal abortion, for inflammatory disease in the pelvis. Blood examinations are not of much diagnostic value in tubal pregnancies except when they show secondary anemia. The leucocytosis found in tubal pregnancies is usually of little or no diagnostic value. Differential white-cell counts have, in our experience, been disappointing in distinguishing between tubal pregnancy and pelvic infections.

Treatment. — The treatment of the hemorrhage from the uterine decidua is not especially important. It is well, however, to curette the endometrium when operating for the tubal pregnancy. The ideal treatment of the internal hemorrhage is prophylactic. One should detect the pregnancy before rupture or abortion results and should remove the tube.

The treatment during acute intraabdominal hemorrhage should be immediate operation, if good facilities for operation are present, otherwise it should be along the lines of the treatment of any internal hemorrhage. The value of normal saline solution during the acute hemorrhage is questionable. It favors blood coagulation, but may increase the bleeding by raising the blood pressure. I believe that it should be used even during acute hemorrhage.

The ideal treatment of tubal pregnancy is an abdominal section as soon as satisfactory arrangements can be made. Pelvic hematoceles, when suppurative, should be opened and drained per vaginam. In other hematoceles one should determine in each individual case whether the operation shall consist

in vaginal section and drainage or in a radical operation through an abdominal incision. In cases of abdominal abortion it is sometimes possible to leave the tube; but this is seldom advisable on account of the dangers of adhesion, salpingitis and hydrosalpinx. Vaginal celiotomy is an ideal operation in experienced hands in selected cases when the disease does not extend above the pelvic inlet

THE HEMORRHAGE OF PLACENTA PREVIA.*

BY

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It is not my purpose to present an exhaustive thesis on placenta previa, but merely a discussion of the nature and cause of the resulting hemorrhage and its treatment in the interests of mother and child.

The hemorrhage of placenta previa is characterized as unavoidable (Rigby), in contradistinction to other obstetrical hemorrhages, more especially that designated "accidental." The loss of blood is maternal except where the placenta is torn by the attendant, with resultant fetal hemorrhage. The child dies not from loss of blood but from asphyxia due to deprivation of the normal supply to the placenta of oxygenated maternal blood.

The hemorrhage occurs during labor or pregnancy and then most commonly in the eighth and ninth months; but it may take place much earlier. It occurs earlier the more nearly central is the implantation of the placenta. It is highly probable that many cases of spontaneous abortion and miscarriage are instances of placenta previa in which the true condition is unrecognized.

During pregnancy the hemorrhage is not apt to be dangerous, but at the end of gestation or the beginning of labor it may in a few minutes place life in the greatest danger. Death may be sudden after the hemorrhage has entirely ceased.

It is comparatively easy to understand why there should be hemorrhage during labor, inasmuch as the lower segment of the uterus must dilate and alter its relationship to the superimposed placenta, gliding as it were upon its surface, breaking their connection and severing the communicating bloodvessels. But

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why does hemorrhage occur in pregnancy and even at quite an early period? This has received various explanations. A disparity of growth between the placenta and the site of its attachment to the uterus is offered as an efficient cause, but opposite views are held as to the nature of this disparity. Some hold that the expansion of the uterus is more rapid than of the placenta (Depaul, Jacquemier) and others (Barnes, Legroux) that the placenta spreads the more rapidly.

A better theory is afforded by a consideration of the mode of production of placenta previa in at least certain of the cases. I refer to the development of the placenta, in part at least, upon the decidua reflexa rather than as normally upon the serotina. It has been commonly held that the decidua reflexa coalesces with the decidua vera and remains a permanent structure, the two blending in one double-layered membrane. It has been shown by Webster, Minot and others that this blending occurs only to a partial extent and in varying degrees, and that by a process of degeneration the reflexa disappears in certain parts. Especially is this true in the outer polar part where it is less highly vascularized, while the basal portion partakes of the character of the serotina, with which it is continuous. This portion seems to be especially well developed in cases in which a reflexal placenta is formed and consequently is less subject to degenerative and necrotic changes. In consequence of these, however, rupture of its substance with consequent hemorrhage eventually occurs. Should this hemorrhage take place in the earlier months it produces abortion. The period at which the bleeding occurs would seem to be governed by the degree of degeneration of the reflexa and the firmness of its union to the vera. Where the reflexa is unusually thick and strong, hemorrhage may not occur until the eighth or ninth month, nor even until full term. Cases, however, that go to full term without hemorrhage are probably not cases of reflexal placenta, but of primary low implantation of the ovum.

It is easily seen, therefore, why in pregnancy hemorrhage may occur independently of uterine contractions, accidents, shocks, or any assignable cause. It is obvious also that hemorrhage may occur from any of the causes that are operative in cases of normally situated placenta, ablatio placentæ.

The hemorrhage of placenta previa may easily be mistaken for accidental hemorrhage unless the placenta is within easy reach of the examining finger. It may also be confounded with hemorrhage due to rupture of the uterus.

The treatment of placenta previa is essentially that of the hemorrhage. No one definite plan is applicable to all cases. The period of pregnancy or labor at which the hemorrhage occurs, the condition of the os, and the situation of the placenta must govern the treatment. If the hemorrhage occurs in the early months and the diagnosis can be established, unless abortion occurs, it should be induced and the uterus emptied in accordance with the well-known rules of procedure.

At the approach of the seventh month the propriety of waiting for the viability of the child claims consideration, but inasmuch as the fetal mortality is high under the most favorable circumstances and with the most approved treatment the child's claims are not to be weighed against the risk of the mother's life. If the hemorrhage is slight, an attempt may be made to conduct the case into the viable period, keeping the patient in bed and watching her carefully. But if the hemorrhage is persistently recurrent, labor should be induced at a time when the physician can give it his continuous attention.

For the immediate treatment of the hemorrhage of pregnancy a vaginal tampon of sterile or medicated gauze may be necessary although in moderate cases mere rest in bed is sufficient. The foot of the bed may be raised and cold applied to the pelvis. Winckel's suggestion to use a vaginal douche of hot water and vinegar scarcely commends itself to my judgment, as it is liable to induce labor. Neither does the colpeurynter appeal to me as in any way superior to the tampon.

When labor occurs, whether spontaneous or induced, our chief care is still the control of the hemorrhage. If the case is one of lateral placenta previa, with a dilatable os and a breech or head presentation, mere rupture of the membranes may fulfill every indication, as this stimulates uterine action and, driving the presenting part downward, compresses the placenta against the bleeding vessels of the uterine wall. In cases of transverse presentation the membranes must not be ruptured until version is, or is about to be, performed. In the intervals between the pains pressure over the fundus to maintain the descent of the presenting part is advisable. If the uterus should exhibit inertia then, in case of a breech, the bringing down of a foot, or in case of a head, the application of forceps, with moderate traction in either case, gives abundant control.

We have in Braxton Hicks' combined method of version with the bringing of a foot through the cervix one of the most effec-

tive methods of controlling the hemorrhage, while the os is still dilated only sufficiently to admit two fingers. Direct internal podalic version is frequently employed in accelerating and terminating the labor. If necessary, it may be effected through the placenta. Manual dilatation and all manipulations through the cervix should be cautiously performed, as they endanger a fatal tear of the cervix and lower segment. I have not found rigidity of the os to be a condition of placenta previa.

When the previa is complete, the bleeding severe, and the os undilated, the use of Barnes' dilators or the balloon of Champetier de Ribes is an effective agent, controlling the hemorrhage by pressure while stimulating the uterus and dilating the cervix. But perhaps of equal merit is the cervical, or the cervical and vaginal tampon, which should be of sterile strip gauze and should be vigorously and firmly inserted. As to the length of time it is allowed to remain, I am guided by the apparent progress of the case, as indicated by the force and frequency of the pains. I do not leave the case, however, unless in the hands of a competent attendant.

Detachment of the placenta from the neighborhood of the os as far as the finger can reach was recommended by Barnes as promoting and facilitating dilatation of the cervix and lower uterine segment by freeing these from their adhesions. The more rapid the dilatation the more efficient is the control of the hemorrhage, owing to the condensation of the uterine tissue lying between the os and the contraction ridge, with consequent closure of its vessels. I have employed this method in conjunction with the tampon with considerable satisfaction, but a recent experience has caused me to regard it with some trepidation. Not only is it dangerous to the fetus but also to the mother. My case was a primapara with very complete previa, who had had considerable hemorrhage previous to labor and for which the attending physician had employed tampons for a number of days. On removing the tampon I separated the placenta vigorously for a considerable distance and was suddenly confronted with a most alarming hemorrhage. I hastily applied the forceps to the head and by traction obtained control of the hemorrhage, and then awaiting the completion of dilatation, I conducted the delivery deliberately. The patient was under chloroform, which may be judged to have increased the hemorrhage. The child of course was dead, and the mother greatly exsanguinated, but by the use of normal salt solution

and under the assiduous care of her physician for several days she eventually recovered.

The review of this case brings me to the consideration of Cesarean section for certain cases of placenta previa. I am aware that I here tread on dangerous ground, that the operation has not received the endorsement of obstetric authorities, and that it is not advisable as a general procedure. I would no more advise it for all cases of placenta previa than for all cases of pelvic contraction, to the exclusion of other methods. But in regard to the case above referred to, I am impressed with the belief that Cesarean section would not have placed her in so great jeopardy as she incurred, while the survival of the child may be reasonably presumed. I see no ground for fear of post-partum hemorrhage, as it is perfectly feasible to pack the uterus with gauze and to remove it subsequently through the vagina. As an offset to the mutilation and cicatrices of the section the risk of laceration of cervix and perineum are escaped.

Vaginal Cesarean section has no legitimate place in the treatment of placenta previa.

103 STATE STREET.

A CASE OF SARCOMATOUS DEGENERATION OF A FIBROID TUMOR OF THE UTERUS WITH REPEATED HEMORRHAGES INTO THE TUMOR.

BY

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(With One Illustration.)

The transition of fibroid tumor of the uterus into sarcoma is an occurrence of comparative rarity, and inasmuch as the mechanism of the degeneration has never been fully explained, it is of value to report every instance of such change. The case here reported is of importance first, in that the history is clearly that of a slowly developing fibroid tumor suddenly undergoing malignant change, and also because of the large hemorrhages into the substance of the tumor which occurred at various times, extending probably over a period of years.

The patient, Mrs. A. J., aged 56 years, was admitted to the

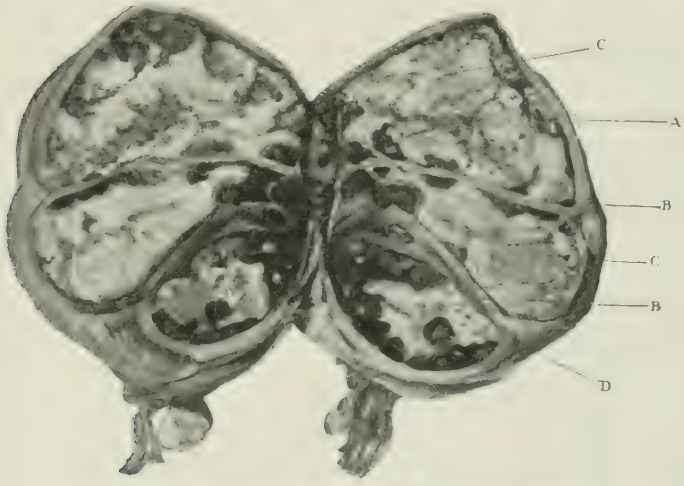
Polyclinic Hospital June 30, 1904. She has had one child, 18 years ago, and two miscarriages. Never has been ill except that she suffered from uterine hemorrhages from the 45th to the 52d year. For the past four years she has had no bloody discharges. In her 45th year she first noticed a small tumor in her abdomen, which, except for the hemorrhages, caused her no discomfort until about a year ago, when it became rapidly larger and painful. She had lost flesh and strength rapidly.

Examination showed a large, hard, freely movable tumor, filling the pelvis and extending to above the umbilicus; there was free fluid in the peritoneal cavity. Heart:—Prolongation and roughening of the first sound, heart action forcible. The arteries showed marked atheroma. Lungs negative. Urine negative.

Operation:—Abdomen incised in median line, from two to three liters of clear serous fluid evacuated from abdominal cavity. At the point of contact of the tumor with the abdominal wall there was a patch of roughening on the tumor and parietal peritoneum. There were no adhesions, and supravaginal hysterectomy was performed. The patient made a smooth recovery, being discharged Aug. 1, 1904.

Pathological report by Dr. E. A. Schumann:—The specimen consists of the uterus amputated at the internal os, both ovaries and tubes. The uterus is the seat of a large pear-shaped tumor of dense consistency. The organ measures 23 centimeters in length, 21½ centimeters in breadth, and 18 centimeters in thickness. The tumor is fairly firm, rounded, of grayish-pink appearance, covered with a glistening serous covering. On the anterior surface this covering is the seat of extensive fibrous thickening which presents a creamy color. On deep pressure the internal portion of the mass imparts a sensation of yielding. The subserous vascular supply is abundant and easily made out. On the postero-inferior aspect of the tumor is the uterus, which is merged into the growth. The cavity is obliterated by its walls being pressed together, takes a curved direction parallel to the walls of the tumor and is enlarged by stretching. The uterine mucosa shows no change and is free from adhesions. The cervical canal is patent. On section the tumor consists of the hypertrophic and expanded uterine muscle of the anterior uterine wall, which has undergone extensive hyperplasia of connective tissue and is the seat of a typical fibroid change. It varies from one-half to two centimeters in thickness. The

entire tumor cavity is divided into three almost equal spaces by bands of dense connective tissue varying from five to fifteen millimeters in thickness. These bands of connective tissue are evidently portions of the uterine muscle which have been separated from the uterine wall by the dissecting hemorrhages which have taken place from time to time. The cavities are occupied by a friable substance which on section presents the greatest variety of color, dark purple, red, pink, gray, and has the appearance of a gradually accumulating blood clot which is partly organized and partly degenerated, and which alternates with



Sarcomatous Degeneration of Uterine Fibroma.

A. Uterine muscle. B. Septa of connective tissue dividing tumor. C. Masses of sarcomatous tissue. D. Organized hemorrhages into tumor.

masses of gray friable tissue, evidently malignant in character. In some areas the organized tissue is firm and has a fibrous appearance. It is noticed that the dark purple and moister area consists of bands adjacent to the trabeculæ. The variety in colors and a certain tendency to layer formation seem to indicate that the clot is an accumulation from several successive stages of hemorrhage into the growth. The tubes and ovaries are normal in all respects.

Microscopically the tumor is composed of the hypertrophic uterine wall which shows extensive hyperplasia of connective tissue with an increased vascular supply. This portion of the growth presents the typical picture of a hard fibroma with the

fibers of connective tissue exceeding in amount the scant and widely dispersed cells. As the interior of the growth is approached the uterine muscle begins to be invaded by a dense collection of short spindle cells, which in turn become round toward the center of the growth. The blood vessels are more numerous, thin walled, and surrounded by rather dense collections of the short spindle-shaped sarcoma cells. This portion of the tumor is a spindle-celled sarcoma with a relatively large amount of intercellular tissue. The cells are arranged in whorls around the numerous blood vessels. They are interspersed with a large amount of connective tissue. The endometrium is normal, save for a slight interstitial endometritis. Large, partially organized hemorrhages compose fully two-thirds of the entire tumor. These have occurred at various periods as shown by the variation in organization and degeneration of the clot. The diagnosis then is that the growth is an old fibroma of the anterior uterine wall, of slow development, with a sarcomatous degeneration of the spindle-celled type, beginning in about the center of the tumor and causing repeated hemorrhages into the tumor-mass.

The sarcomatous degeneration of fibroid tumors of the uterus is of comparatively rare occurrence. A rather careful study of the literature found less than 80 cases reported. Various hypotheses are advanced as to the cause of this degeneration. While it is generally held that the transition is a direct metaplasia of the cells of the uterine muscle with sarcomatous cells, there has been no case reported which definitely proves the fact. In the case reported above, the history of a slowly growing tumor of long standing, with no local manifestation and no cachexia, followed by sudden loss of flesh and strength and the evidence of malignant intoxication would seem to justifiy the conclusion that a true sarcomatous degeneration of a fibroid had occurred. The exact histogenesis of the degeneration it is impossible to determine in this case.

TRANSACTIONS OF THE CHICAGO GYNECOLOGICAL SOCIETY.

Meeting of June 7, 1905.

The President, J. CLARENCE WEBSTER, M.D., *in the Chair.*

CARCINOMA OF THE POSTERIOR WALL OF THE BLADDER.

Dr. J. CLARENCE WEBSTER.—I present a specimen which was removed from a woman 69 years of age. The case was one of carcinoma of the posterior wall of the bladder, which had caused hemorrhage for about three months. Examination with the cystoscope revealed an irregular area on the posterior wall of the bladder, about three-quarters of an inch in diameter, partially raised, partially depressed. There was ulceration, and the raised areas were very hard. The woman was weak and somewhat anemic. I carried out the operation entirely under local infiltration anesthesia of the skin with the Schleich No. 2 mixture. I made a wide transverse incision nearly an inch above the pubes, dividing the lower end of the recti and fascia down to the external peritoneal tissue. The bladder had previously been filled with salt solution and a rubber bag had been placed in the rectum. The peritoneum was dissected from the posterior wall of the bladder, and the latter was incised without any further local infiltration anesthesia, and the diseased area was removed. The aperture in the bladder-wall was closed with formalin catgut; the ends of the divided recti and fascia were approximated by means of catgut and interrupted silk sutures which also included the skin. A drainage tube was left in the middle portion of the wound above the pubes. The bladder was drained through the urethra with a rubber catheter, which I took out on the ninth day. For three or four days the patient made water at intervals of about an hour, without any leakage from the abdominal incision; then a little urine appeared in the latter, and I again placed the catheter in the bladder and kept it there for four or five days longer. The urinary leakage ceased at once, and after the removal of the catheter from the bladder there was no further escape of urine through the abdominal wall. The patient has continued to improve, and is now ready to leave the hospital. She can hold her urine for from two to two and a half hours.

The case is interesting from the point of view of the nature of the procedure, which was quite extensive, carried out without any general anesthetic, and because of the short period of escape of urine from the abdominal wound

TWO CASES OF ABLATIO PLACENTÆ.

Dr. Rudolph W. Holmes.—In line with the symposium of the evening, I wish to report two cases of premature detachment of the placenta.

Case I.—Mrs B., 38 years of age; VI-para at term; a large, phlegmatic woman, entered my service at the Augustana Hospital, and was delivered October 9, 1904. All her labors had been easy, and the babies large. The last, the smallest of the six, weighed 8¼ pounds. The patient had suffered considerably for some weeks from dyspnea, the result of pressure from hydramnios. Her urine showed the presence of some albumin and casts. Edema of the extremities had been present for some weeks previous to her entrance into the hospital. On account of the dyspnea her usual mode of resting was to sit in a chair with her head on a table. While thus resting at 1 A.M. she was aroused by a gush of clotted and free blood without any premonitory signs. She hurriedly arose and started for the bed, but fell fainting. The nurse, hearing the fall, quickly reached her and placed her in bed. Twenty-five minutes later I found the uterus in a condition of tetanic contraction. On the right side of the uterus a characteristically developed accessory tumor had formed. This extended from nearly a hand's breadth below the umbilicus to two fingers' breadth above that point. As this irregularity of the uterine contour had not been present a day or two before, it was evident, in view of the hemorrhage, that there was a placental detachment with retained blood clots. The os was found dilated sufficiently to admit two fingers. no placental tissue was palpable, and the membranes were tense. Preparations were made for immediate delivery. The child was presenting in an L. O. A. position. The anesthetic was begun at 2.35 A.M.; manual dilatation was begun at 2.55, and completed at 3.10, the cervix being very easily stretched. During the period of dilatation the head descended into the pelvis. Forceps was applied, and the dead child easily extracted. There was a question whether the child were still alive, the interne believing he heard fetal tones. At any rate the child had only recently died. The placenta was at once expressed by the Credé method, accompanied by a number of large, old, black clots, not far from a quart in amount; the antepartum blood loss must have been materially over this amount. The uterus and vagina were packed with ten yards of chinosol gauze. The woman recovered without any untoward symptoms. The evil effects of the anemia were transitory.

Case II.—Mrs. T., age 26, II-para., 7th month of pregnancy. An examination of her urine a week before the accident showed a bare trace of albumin, total amount, 1800 cc., specific gravity 1010, and urea .7 per cent. The day after this examination she went to the country for a couple of weeks. Six days later, while riding, she had an intense desire to urinate; in a moment there was a gush of fluid which stained her clothing no more than would the

liquor amnii. She hurriedly drove to town, saw a physician, who informed her she was to have a premature labor, and advised her to get to bed as soon as possible. The gush of fluid occurred at 4.30 P.M.; at 6 she was in bed. At 7 o'clock she had severe nausea and some vomiting. At about 9 o'clock a severe headache developed, and at 9.45 she had an eclamptic convulsion. I reached her at 4 A.M. A moment after I entered the house the second convulsion occurred. A cursory examination showed the presence of a tense uterus with no abnormal contours; a slight show of blood was escaping from the vulva. The physician considered that the membranes had ruptured. The preparations for an operative delivery were quickly carried out. The chloroform anesthesia was begun at 5.20. At 5.30 the examination showed intact membranes, the cervix nearly effaced; the os admitted two fingers, and no placenta was within reach. The absence of the placenta from the lower uterine segment, the escape of the serum, and the subsequent hemorrhage were sufficient evidences of a premature detachment of the placenta. The os was dilated in about thirty minutes. As in the preceding case, the manual dilatation produced sufficient uterine action to force the head of the child into the pelvis. Again there was a question as to the condition of the child, so the forceps was applied and the extraction easily consummated, but the child was dead. The placenta was removed manually; with it came some large black clots, many of which were firmly adherent to the maternal surface. This specimen beautifully shows the effect of the blood retention, with the resultant placental compression; fully three-quarters of the maternal surface has been depressed. This placenta clearly shows how the upper border (as it was situated in the uterus) first separated, how the blood serum, without the corpuscular elements, slowly dissected its way downward between the uterus and placenta until it no longer was under restraint, and escaped. In the development of the placental separation and the formation of clots, serum was extruded from the clots, appearing at the vulva long before the actual blood. The uterovaginal tampon was applied, and the woman placed in bed in fair condition, at 6.30 A.M. During the morning and early afternoon there was marked improvement in the general condition; consciousness appeared to a certain extent, the bowels moved slightly under catharsis, perspiration was induced, and ten ounces of urine were drawn by catheter at the end of eight hours. This urine contained 20 per cent. of albumin, an enormous number of casts, and urea 1.5 per cent. At 5 P.M. there was a third convulsion which marked the beginning of the end. The pulse rapidly rose from 68 in the mid-morning to 100 at the time of the convulsion; thereafter, it mounted to the final countings of 160-170. Eighty minutes before dissolution the rectal temperature was 107. For some hours there was marked edema of the lungs. In view of the fact that the pulse remained slow until some hours after the delivery it is perfectly permissible to declare

that this patient was in no way compromised by the premature detachment, but on the contrary, that her hemorrhage was of signal benefit to her. The immediate cause of death was eclampsia.

UTERINE FIBROID.

Dr. T. J. Watkins.—This specimen, removed yesterday, beautifully illustrates the condition of the endometrium in some cases of uterine fibroids. The endometrium is very much atrophied in some parts and hypertrophied in others. This is characteristic of many fibroid tumors. There has been no endometritis in this case, so that these changes cannot be due to endometritis.

Dr. T. J. Watkins showed three specimens of

INCOMPLETE TUBAL ABORTION.

The first specimen is an incomplete tubal abortion. The tube is very small and has not been opened. It was removed some three or four weeks after the first symptoms of abortion occurred, and it illustrates the favorable progress of tubal abortion in some cases. Judging from this specimen, one would conclude that the patient would have had no more hemorrhages and would have made a complete recovery without operation.

The second specimen of incomplete tubal abortion was removed three weeks ago. The signs of hemorrhage into the abdominal cavity had lasted about two weeks. The abdomen contained a large amount of blood, probably about one pint. The abdominal ostium was dilated, and the hemorrhage into the abdominal cavity took place through it. There was no rupture of the tube. Whether this contains a fetal sac or not I do not know, as I did not with to destroy the specimen by incising it.

The third specimen also illustrates incomplete tubal abortion, a severe hemorrhage had taken place through the abdominal ostium, but the fetus was *in situ*.

Dr. Thomas J. Watkins read a paper on

HEMORRHAGES IN ECTOPIC PREGNANCIES.*

Dr. J. B. De Lee read a paper entitled

ABRUPTIO PLACENTAE (PREMATURE PLACENTAL DETACHMENT).

In normal labors separation of the placenta does not usually commence until the child has been delivered. It may, however, normally begin as the trunk of the child is passing through the vulva. Observations in cases of Cesarean section have shown the placenta separating as the child was removed, and also, that it remains generally attached till the contraction and retraction of the actual third stage have begun. One may, therefore, speak of

*See original article, page 880.

premature placental detachment in all cases where the placenta separates, in whole, or in part, from its attachment to the uterus, before the head of the child has been delivered. In breech cases the same definition will apply, and is even more applicable from a clinical standpoint.

Under this definition may be included several examples of detachment of the placenta.

First. Placenta previa, the development of the placenta in the lower uterine segment, in the zone of dilatation. When such dilatation begins, the placenta commences to separate and hemorrhage results. Premature detachment of a placenta situated low in the uterus may give rise to symptoms of placenta previa and also of premature detachment.

Second. If the placenta separates during the last few minutes of the second stage of labor, the child is delivered dead or in a state of asphyxia, depending on the length of time since the interruption of its circulation took place. The exit of the child is attended by a gush of blood, and often followed immediately by the placenta. Such cases are not rare. A short cord may be the underlying cause, or the unruptured membranes, pushed before the advancing head, may draw the placenta after it. Similar to this form of detachment is the premature separation of the placenta in breech cases, while the trunk is being delivered. The clinical importance of the occurrence is slight.

Third. The separation of the placenta in twin cases after the delivery of the first child. This requires early diagnosis and quick treatment. Both mother and child are endangered. The condition is recognized by the appearance of external hemorrhage, and the change in the heart tones of the second child.

Fourth. In shoulder presentations, in prolonged labor, in head presentations, the placenta not seldom separates before delivery. In such cases the danger of hemorrhage is not great, probably because the uterus is contracting forcibly, and holds the placenta firmly against the fetus, and because the contracted and retracted uterus mechanically closes the vessels in the placental site. In performing version, the writer has felt the placenta rise off the uterine wall under his hand. In these cases the child was saved only by rapid delivery.

Finally, there is the premature detachment of the normally implanted placenta, in pregnancy or early in labor. This means just what it says, but the phrase is cumbrous, and one would wish for a shorter term, to use in apposition to "placenta previa" the other most common form of obstetric hemorrhage. The English still retain the term, "accidental hemorrhage," to express what we and the Germans call premature detachment of the normally implanted placenta. A less cumbrous term is desirable, and R. W. Holmes has suggested ablatio placentæ. A Latin term that more nearly expresses the anatomical conditions present, would be *abruptio placentæ*, from *ab*, away from, and *rumpere*, to break off, or tear off. Ablation means to remove or destroy. One speaks

of ablation of a tumor. Neither term expresses prematurity, or that the placenta is normally situated, although abruption conveys a sense of suddenness or unexpectedness.

The causes of this condition are variously given. Accident plays a certain rôle, but probably in most cases the accident has acted on a diseased uterus, or decidua or placenta, or in the presence of constitutional disorders as hemophilia or scurvy. The best proven causes of abruption of the normally implanted placenta are, endometritis deciduæ, nephritis, acute and chronic, and disease of the uterine wall. Isolated cases are reported where hemophilia, exophthalmic goiter and acute hemorrhagic infectious diseases, were present. Under such circumstances any trauma, however trivial, may cause the initial bleeding. Once a separation of the placenta begun, it is easy to understand how it may become complete. That a healthy uterus can distend sufficiently to allow a fatal hemorrhage within it has been denied. The normal uterus is not filled by the growing ovum, and a hemorrhage, or some other influence may paralyze its retractility.

If one includes all the varieties of premature placental detachment, the occurrence is very common. If one specifies only those cases assembled under abruption of the normally implanted placenta, they are quite rare. Partial separation of the placenta is not uncommon. This condition is often recognized only by finding an old clot in a depression of the placenta. Complete separation of the placenta is very rare and fatal.

The detachment may be partial or total, and the hemorrhage may be external, or internal, or both. The blood may raise up the placenta in the middle, bulging either the placenta inward or the uterine wall outward. The blood may burst through the membranes into the liquor amnii; it may separate the membranes all around, allowing the ovum to rotate in the uterus, so as to bring the placenta over the os (prolapsus placentæ); all these are the internal or "concealed" hemorrhages. The blood may trickle down under the membranes, and escape externally; this may be the only bleeding (external form), or most of the blood accumulates inside the uterus, only part escapes (combined form).

If the abruption of the placenta is complete the fetus dies; if only partial, it may live. If the hemorrhage is slight and external, this may be the only symptom. If the separation and hemorrhage are greater, the symptoms of anemia and the signs of hemorrhage into the uterus are present. The latter are sudden and increasing distension of the uterus and of the abdominal wall, tenseness of same, an irregular shape of the tumor (bulging of the hematoma under the placenta), tenderness of the uterus, especially at the site of the placenta. The patients usually have a sudden pain, later continuous on one side of the womb. If the hemorrhage is all internal and copious, shock is present in addition to the effects of anemia. Sometimes there may be a partial rupture of the uterus, as occurred in a case of the writer. External hemorrhage is present in nearly every case, and in the intervals of the gushes, a dis-

charge of serum not infrequently occurs. No diagnostic reliance may be placed on the occurrence of the flow with the uterine contractions or in the interval. In a tense uterus, the hemorrhage is more likely to appear externally. In a weak uterus the blood may accumulate more readily. The amount of blood discharged externally should not be used as a criterion of the severity of the case, only the signs of anemia as indicating the amount of internal hemorrhage may be consulted.

In the differential diagnosis we have to consider, placenta previa, rupture of the circular sinus of the placenta, rupture of the uterus, rupture of a collection of pus into the belly, rupture or torsion of ovarian cyst, and extrauterine pregnancy.

In the mild case, the maternal mortality is not appreciable, but the fetal mortality is high. In those cases occurring near the end of labor, the mothers usually recover. In the severer cases, especially in the concealed variety, the maternal death rate is about 50 per cent. and the fetal, 90 per cent.

The writer presents the following summary of the treatment he recommends, basing the same on his own experience of 12 cases, and on a study of cases reported in the literature. 1. If the cervix is effaced and the os dilated, deliver at once. 2. If the cervix is effaced and the os only partly dilated, procure complete enlargement of the os by manual dilatation, the Bossi dilator, or by incisions, and deliver at once. 3. If the cervix is neither effaced nor dilated, deliver at once by vaginal or abdominal Cesarean section. 4. If the symptoms are not very threatening, or if the patient's surroundings are not favorable for such radical operative measures, or if the physician has insufficient skill, tampon the vagina very tightly with a large amount of dry cotton, put on an abdominal binder, drawing it as tight as possible by using the Spanish windlass principle, give ergot and wait. 5. Do not rupture the bag of waters until just before delivery, and if the membranes rupture before this time, immediately fill the cervix with a colpeurynter or Barnes' bag. 6. While performing the above, treat the anemia. 7. In the third stage of labor be prepared to treat hemorrhage promptly and definitely. The utero-vaginal tampon is very valuable.

Dr. Andrew McDermid read a paper entitled

THE HEMORRHAGE OF PLACENTA PREVIA.*

Dr. C. S. Bacon.—In the paper of Dr. Watkins one point might be brought out more prominently. He advised, if I understood him correctly, the removal of the tube with its contents in every case. Let us suppose a case like this: A woman who lives in surroundings unfavorable for an operation, who has symptoms of internal hemorrhage from a tubal rupture or abortion, is found in a condition of profound shock, with pulse scarcely felt at the wrist, and suffering intensely. It is almost certain that she would not stand a ride of two or three miles over bad roads to a

*See original article, page 885.

hospital, and it is almost impossible to treat her at home. That is an extremely practical everyday case, and in such cases there is only one thing to do, namely, the patient should be kept absolutely quiet and given one-half grain of morphine hypodermically. The best nurse that can be found should be put in attendance upon her, and the probability is that the hemorrhage will stop of itself. At any rate, the patient can be kept alive until the next day, when it is possible to make arrangements for an operation. Furthermore, if I understood Dr. Watkins rightly, he considers that shock is not as important a symptom in tubal abortion as it is in rupture of the uterus. I believe there is severe shock in tubal abortion.

Dr. De Lee has presented the subject in the proper light and the order of relative importance of the various procedures. Possibly he did not sufficiently emphasize the importance of a specific therapy. It is rather dangerous to try any other measures than those that will certainly stop hemorrhage, and we have two measures that will do this as long as they are carried out. One is version and tamponing the placenta against the surface or lower uterine segment by means of the leg of the child. As soon as turning can be done in a case of severity, or where there is an accurately diagnosed condition of placenta previa, that is certainly the safest procedure unless one is able to apply a metreurynter, to insert into the uterus a bag and use it as a tampon until the cervix is dilated. The latter method may have some advantages, but it is not so easy to perform as the first. It requires some assistance, and as there is more risk of hemorrhage attending it, it is not to be undertaken unless one has had some experience in the use of the bag. If without experience and assistance, the obstetrician should always turn and tampon, but not deliver the child. These remarks apply in case the uterus is dilated so that a finger can be introduced and a combined Braxton-Hicks version can be done. But, not very rarely, the cervix cannot be entered, and in these cases we must rely upon the tampon until the cervix is softened and dilated, and until the patient is in such condition that she can be anesthetized and version performed. In such cases the tampon must be used, and emphasis should be placed on the technique of the tamponade. I doubt very much whether gauze is the proper material for a tampon. A tampon certainly cannot be introduced with the patient on the back, and in order that it may be efficient the patient should be placed in the exaggerated Sims' position, and some substance used that can be tightly packed into the vagina, as, for instance, sterile cotton that has been saturated, and has had the excess of fluid squeezed out of it, which will make a more efficient tampon than gauze. This, then, should be considered as a specific therapy. It is true, occasionally, that when the cervix is partly dilated, when labor is progressing rapidly, when the placenta is only marginal, it might be safer to run the risk of rupturing the membranes and forcing

labor. In a case where one could, if necessary, apply forceps, when the cervix is pretty well dilated, and where one remains with the patient and watches her with the greatest of care, it may be done, but without such study and personal attention, that method of treatment should not be employed. The insistence upon absolute arrest of hemorrhage in every case as a specific therapy is important.

Dr. Charles E. Paddock.—The opinion of Dr. Watkins that an early examination should be made in every case of pregnancy meets with my approval. Those who were students of the late Dr. Jaggard will remember his oft-repeated statements that the physician who makes the early examination with the idea that there may be an ectopic gestation, is the one who generally discovers such a condition before rupture.

The advice of Dr. De Lee as to the use of ergot under certain conditions of accidental hemorrhage is good.

Dr. McDermid speaks of the viability of the child, in the consideration of placenta previa. While we generally consider the fetus viable at the twenty-eighth week, owing to the possible loss of blood after delivery we could hardly expect that with a placenta previa the child would be viable at this time; in fact, the thirty-fourth or thirty-sixth week, perhaps longer, would give a better prognosis for the child.

To rupture the membranes, as recommended by Dr. McDermid, is certainly not justifiable in all cases. Under certain conditions with a lateral or marginal implantation of the placenta and the woman in labor it would be proper. But to do this expecting labor pains to come on is not good midwifery; we cannot depend upon it. We know how frequently the membranes will rupture hours, or even days, before labor. Again he spoke of the Braxton-Hicks method. In experienced hands it may be done, but very few are sufficiently skillful to successfully perform this operation; therefore, I believe a case should be delayed as long as possible, dilating the cervix by the means of tampon, and then resorting to internal version. The moist packing, I believe, is preferable to the dry packing. Rubber bags or the Champetier de Ribes bags are valuable in experienced hands, but as most of the obstetrical practice is in the care of those who are not familiar with their use, the tampon offers the best results.

The treatment of post-partum hemorrhage begins with the management of the second stage of labor. At least as soon as the head has passed the vulvar orifice, a hand should be kept upon the fundus of the uterus until the placenta is delivered. It was not intended by Credé that the placenta should be forcibly detached. As long as there is no indication for rapid delivery, such as hemorrhage, the delivery of the placenta should be left to nature as much as possible, with gentle stimulation of the fundus of the uterus. The less haste in the delivery of the placenta the fewer cases of post-partum hemorrhage.

Dr. Gustav Kolischer.—Dr. Watkins in his paper touched

upon some very important points, which can, however, be looked upon in a somewhat different light.

Hemorrhages from the female genitals are, per se, not characteristic of any particular condition, but they may become so if united with certain other symptoms. If I understood Dr. Watkins, he claimed that in all cases of hemorrhage from extrauterine pregnanacy, peritonitis develops and that the sac of the hematocele is always formed by products of peritonitis. I would not care to subscribe to this statement. It is not absolutely necessary for the formation of a hematocele that the hemorrhage should take place into a previously formed cavity or that the hematoma be outlined by peritonitic adhesions. In many cases of tubal abortion the hemorrhage forms its own capsule by coagulation and organization of the fibrin. In such cases the hematocele forms a tumor whose summit is absolutely free from all adhesions to omentum or intestines, which readily recede after the abdomen is opened in Trendelenburg's position. Such a hematocele forms and grows in the following way: The blood oozes out of the tubal opening and coagulates there, so that the coagulum surrounds the tubal opening. Additional hemorrhages, later, stretch this first capsule more and more while the additional coagulation thickens it again.

Neither is the immediate development of peritonitis an absolutely necessary sequela of free hemorrhage, subsequent to the rupture of the pregnant tube. The clinical picture will quite often show marked differences between a free hemorrhage into the peritoneal cavity and peritonitis. Free hemorrhage will always cause diffuse pains, while sensitiveness to the touch, so characteristic of peritonitis, is lacking; the reflex rigidity of the abdominal muscles, regularly present in cases of perforatiye peritonitis, is also absent in cases of free hemorrhage into the abdominal cavity in cases of rupture of a pregnant tube. In all cases of suspected abortion one must determine whether one has not to deal with an extrauterine pregnancy and subsequent hemorrhage. Quite a number of women are put in great danger of life or are even killed, because the physician, judging only from the history and from the hemorrhage present, goes into the uterus with a curette and infects the patient, or pulls down the uterus forcibly during his manipulations, and thereby produces rupture of the extrauterine sac, thus causing dangerous or even fatal hemorrhage. While it is true that the ideal treatment of extrauterine pregnancy would be prophylactic, that is, that we should operate before the pregnant tube has a chance to rupture, still in a great many cases that is impossible, largely because there is no suspicion of this condition until rupture occurs. Dr. Banga has published an interesting paper on this subject, so far as the indications are concerned. He comes to the conclusion that if an hematocele forms and coagulation takes place, one can wait; if there is no coagulation, one should interfere as soon as possible.

So far as the diagnosis of extrauterine pregnancy is con-

cerned, in some cases it may be difficult, but we can guard against mistakes if we pay attention to one point. One should not make a diagnosis of extrauterine pregnancy unless the uterus is enlarged.

I agree with Dr. De Lee in most of the points brought out; but I would like to call attention to a certain detail of technique which I consider very important in cases of post-partum hemorrhage also. After packing vagina and uterus a simple binder around the abdomen quite often fails to exert sufficient counter-pressure. The uterus is safely held in forced anteflexion, and thus prevented from rising and becoming full of blood again, only if a pillow is placed above its fundus and the binder then applied.

That premature detachment of the placenta should be so frequent is rather surprising. I do not remember having seen more than one case of pronounced premature detachment of a normally situated placenta. I do not quite see why vaginal or abdominal Cesarean section should be indicated in cases of premature detachment of the placenta. If there is no time to save the life of the mother by compressing the uterus in the way I have mentioned, I cannot conceive how we are going to save a woman by vaginal Cesarean section. Cesarean section is a dangerous operation, as in many cases rupture of the uterus in the line of suturing occurs during a subsequent pregnancy. I would subscribe to all that Dr. Bacon has said concerning placenta previa. One point I would make a little stronger, and that is this: Dr. McDermid mentioned in his paper that under certain conditions we should accelerate labor. I regard that as dangerous teaching, for the reason that it might be misunderstood. We have to caution against any attempt at accelerating labor in a case of placenta previa. If we perform extraction immediately after version, or if we apply forceps in these cases, we run the greatest risk of tearing the cervix. Tearing the cervix in a case of placenta previa is almost uniformly fatal. If a vein around the cervix is ruptured, the woman will die in a short time, and packing does no good. Occasionally it is necessary to rupture the membranes in such cases in order to stop the hemorrhage at once, when called hurriedly and unprepared to a case of central placenta previa attended by considerable hemorrhage. If not provided with instruments for dilating and packing the cervix (colpeurynter and so on), the only way to act is to go through the placenta and perform version.

Dr. Rudolph W. Holmes.—I would first speak of premature detachment of the placenta, or, as I renamed it some four years ago, ablatio placentæ. For conciseness and descriptiveness, I am sure this term is far preferable to either "accidental hemorrhage," or "premature detachment of the normally situated placenta." The suggestion implied in the former that the condition is due to casualties is erroneous, for pathology plays a far more important rôle than do accidental conditions; the second term is too cumbersome for ordinary use. Further, ablatio

placentæ has its analogue in ablatio retinæ. I do not think abruptio placentæ, as suggested by Dr. De Lee, is quite proper: abruptio implies that there is an actual tearing away of the placenta with violence, or great suddenness, which rarely is the case.

When I saw my first case in 1899 I considered I had had the good fortune to observe one of the rarest of obstetric complications. An exhaustive study of the literature, covering a period over a year and a half, and subsequent experience have led me to the positive opinion that ablatio placentæ is not at all infrequent in fact that it is about half as frequent, at least, as placenta previa. My personal observation has comprised four cases of grave placental detachment, two of which I report to-night; of these four two died. One death was directly traceable to the hemorrhage; the other was unquestionably due to the concomitant eclampsia. Besides these four I have had four, if not five, others, which terminated without particular danger to the mother or the child. All the children were born dead where the life of the mother was endangered. My maternal mortality of eight cases was 25 per cent. (actually, however, only 12.5 per cent.) and the fetal 50 per cent. This is a good showing in comparison with the results given in my statistical study (The American Journal of Obstetrics, Vol. XLIV, No. 6, 1901,) for there, of 189 mothers, 32.2 per cent. died; and of 184 babies, 85.8 per cent. died.

Goodell's paper on concealed hemorrhage was the most exhaustive contribution published previous to mine. Quotations from this paper have fostered the conclusion that ablatio was an exceedingly rare condition. This is entirely due to an unfortunate caption to his paper which led to false deductions, as the reader was led to believe he was writing on concealed hemorrhages, when in fact most of his cases were of the patent variety. I might say that almost no paper has been plagiarized so frequently as has Goodell's statistical study.

I would first draw attention to the usual classification of ablatio placentæ, into concealed and external hemorrhages, a classification which I am sure is irrational in view of clinical facts. Practically the one clinical sign of all instances of premature detachment of the placenta which attracts the attention of the obstetric attendant is the presence of varying amounts of old clotted blood in the uterus which are expelled in the third stage. This sign necessarily must be present in all examples of concealed hemorrhage. My own experience, abetted by my study of 200 cases culled from the literature, would force me to the conclusion that practically all examples of the external type likewise have the same sign present. This fact so strikingly impressed me in my work that I felt it essential to suggest a slightly modified classification: *absolutely concealed hemorrhage* would comprise those cases in which no bleeding whatever appeared externally, of which there are comparatively few examples on record: so far as my knowledge goes, there have

been but 113 cases on record up to the appearance of my paper in 1901. The *relatively concealed hemorrhages* would include those in which some external bleeding had occurred; this is the frequent variety. This post-partum expulsion of old, black, "grumous" clots is practically pathognomonic of ablatio placentæ. This clinical fact clearly points the way to decry the statements of those who maintain that occult hemorrhages are due to atonic uteri, while the patent are produced by a "healthy" (?) organ. I cannot too strongly testify to the fact that the manifestation of external bleeding in the relatively concealed type rarely bears a direct relation to the blood lost to the organism, that is, which enters the uterus. The external hemorrhage must only be considered a diagnostic sign, never be the criterion as to the amount which has escaped from the woman's vessels. The systemic evidences of hemorrhages alone should be our gauge in all cases.

Another sign of blood retention lies in the presence of the accessory tumor, a prominence on the uterine wall due to blood stored up behind the placenta. Two of my cases (both of the external type) had this tumor typically, markedly, developed. In my statistical work I found the tumor noted in both types of the condition. If it were possible to palpate the posterior uterine wall, we would find this sign present far more frequently than is the case. Still another sign of this concealment of the blood, in connection with evidences of acute anemia and intact membranes, is the escape of blood serum from the genitalia. This sign is dependent upon blood retention, clottage, expression of the serum from the clot, and its escape from the vulva. The trinity of signs of blood retention which may be as well developed in the one type as the other—the accessory tumor, escape of serum, and post partum expulsion of old clots—indicate that absolute concealment of the hemorrhage is largely dependent upon other factors than the mere tonicity or lack of it in particular instances, factors which will be enumerated under the treatment. Two other signs have their origin in blood retention, severe abdomino-uterine pain, and nausea and vomiting. The former is due to rapid, if not sudden, dilatation of the uterus with the stretching of its wall. This stretching is objectively evidenced by the tense uterine wall and membranes. The latter is reflexly aroused by stimulation of the abdominal ganglia from over-distention of the uterus.

Another word concerning the frequency. In the Dublin Rotunda 70 cases of ablatio and 41 of placenta previa occurred in a series of confinements. One of the past assistant masters informed me he had seen many so-called examples of premature detachment during his service, but few which were actually such. Possibly, the preponderance of the former over the latter at the Rotunda is due largely to the interpretation of lateral previas as ablatio cases. In general, the explanation of the almost entire absence of examples of ablatio placentæ, in a large series of cases, is due to lack of observation by the obstetrician. If

he would make a practice of examining all placentæ after delivery he would find the not rare evidences of at least mild degrees of premature detachment: again, measurements of the shortest distance from the opening in the membranes to the placental periphery is a corroboratory evidence of the type of ante partum hemorrhage.

I agree thoroughly with Dr. De Lee that there is one condition in pregnancy and labor where it is permissible to exhibit ergot, and that is in ablatio placentæ; but it cannot be made too emphatic that the use of ergot in ablatio must be most guardedly carried out. It should never be used in full doses, only in tonic amounts.

I do not believe in the tampon in ablatio placentæ. No one suggests the method in absolutely concealed cases, so I feel that those who recommend it in relatively concealed instances are resting on false premises. The advocates of this measure consider that in occult hemorrhages there is a loss of uterine tonicity, while in the patent types the uterus is "healthy," or more properly, retains its tonicity. This indisputably is, to an extent, true, but this only partially explains the mechanical retention of the blood. The factors which determine the blood retention are: First, the uterine tonicity; Secondly, the adhesion of the placental periphery, or of membranes to the uterus; Thirdly, the plugging of the pelvic brim by the presenting part. That the well-applied tampon does not convert a relatively concealed hemorrhage into a serious concealed type is due more to inherent conditions than to the scientific value of the procedure. If a form of tamponade is to be employed, I believe the hydrostatic dilator should be preferred, for the rubber bag possesses all the virtues of the tampon, with the great advantage in that it actively stimulates labor, which the tampon does not. While I mention the metreurynter in this connection, I would be clearly understood that I believe it is inappropriate for frank cases of premature detachment; at most I would reserve the rubber bags for those cases of minimal hemorrhage in which it desirable to hasten labor, or those in which it is a question whether the bleeding is due to ablatio or high lateral placenta previa. The fact that rupture of the membranes, which I consider theoretically as well as practically an incorrect procedure, and the use of tampons have been of such signal value in Dublin, leads me to believe that the intimation of the past assistant master of the Rotunda is true, namely that many of their "accidental hemorrhages" are really high lateral previas. I am sorry I cannot certify to the benefits of a tight abdominal binder. The times I have employed it in other conditions (particularly post partum hemorrhage) it has been of such positive discomfort, if not actually painful, that I have hesitated to continue its use.

Dr. DeLee has sounded the keynote of the treatment when he states *delivery* is the essential treatment. The method of delivery, whether by manual or instrumental dilatation, vaginal or abdominal Cesarean section is dependent upon conditions

present. Generally the dilatation of the os with the hand or instrument, followed by immediate extraction, will be the procedure of election. During the extraction of the baby through the parturient canal, whether by forceps, craniotomy, or breech delivery, I feel Kristellar expression (firm fundal compression) is absolutely essential. Version should never be performed unless an unobstructed breech extraction is a certainty. A mother is seriously compromised if the child is partially born and long delays occur in delivering the arms or head, for a partially emptied uterus means one with lowered intrauterine pressure, therefore additional hemorrhage. The limitation of version in ablatio is in sharp contrast to it in placenta previa, where its conditions are of the broadest.

In placenta previa, as in post-partum hemorrhage, women are too frequently lost because of too many kinds of treatment, and not enough attention paid to the specific, aggressive procedures, which most certainly will do good. I consider the tampon has a very small place in the hands of the obstetrician in his treatment of placenta previa. He should reserve it largely for emergency cases as a temporizing expedient until his armamentarium is at hand, and not as an essential method of therapeusis. In a few isolated cases, where the os is still closed, the tampon may be used temporarily until there is sufficient dilatation for the introduction of the bag, or to perform Hick's version. The tampon is indispensable in such instances, for digital or instrumental dilatation should be held strictly contraindicated in placenta previa. For the general practitioner I believe the tampon will give him the happiest of results. I find in practice that physicians have not a full realization of what an obstetric tampon is; they have a hazy idea that it is the same thing as a gynecological tampon. I have seen a "tampon" removed from a placenta previa case consisting of a few balls of cotton. The actual *plugging* of the vagina is far different. Gauze is really an abomination as a plug; cotton only should be used. It is really surprising how much cotton may be placed within the vagina; in many multiparæ it is possible to place nearly a fifth of a pound of cotton. I use small pledgets soaked in lysol, wrung dry, in my abortion work, and in other hemorrhages.

I would repeat, by way of emphasis, what others have said: where the metreurynter is used or version has been employed, extraction never should be hastened; the expulsion of the child should be largely, if not entirely, left to nature. Rapid extraction is almost certain to tear the cervix, with serious consequences. Furthermore, if the woman has lost much blood, rapid extraction means a lowering of the abdominal pressure; this means shock, which is a serious complication in an anemic woman. During spontaneous expulsion we have time to combat the effects of blood loss by approved measures. Finally, there is no condition in obstetrics where the prophylactic application of Dührssen's uterovaginal tampon is followed with such happy

results as in placenta previa; in my own work I feel the treatment of the case has not been completed until th is tampon is in place

Dr. George Schmauch.—In most cases of extrauterin. pregnancy, as Dr. Watkins has stated, the detachment of the decidua causes the hemorrhage. There is, however, sometimes quite profuse bleeding, which persists for weeks, and in these cases the source of hemorrhage is without doubt the same as that of internal bleeding. The blood escapes from the tube into the uterine cavity. The Fallopian tube in a case of extra-uterine pregnancy is a thick-walled canal and the abdominal pressure is liable to press out liquid blood from the uterine end of the tube into the uterine cavity. As to hematocele, the tube is immersed in it and hemorrhage often originates from the liquid kernel of the hematocele.

I do not remember to have seen more than one or two cases of premature detachment of the placenta, and this denomination should be reserved for those cases only in which the placenta is normally implanted and the os is in the early period of dilatation. We cannot speak of premature detachment of the placenta in cases of placenta previa, or in cases of lower implantation of the placenta, because this is the normal occurrence. The placenta is normally detached by the contractions of the uterus as soon as the greater part of the child has left the uterine cavity. In regard to the treatment, as soon as the cervix is dilated to the extent of admitting two fingers, version should be performed. The hand of the obstetrician is not such a perfect dilator as the foot or the breech of the child. I do not think the name "abruptio placentæ" is well chosen. Ablatio placentæ is the better term.

Dr. Frank Cary.—I agree with Dr. Bacon's remarks with reference to placenta previa. Every case of placenta previa should be treated individually. The physician, when he goes to see a pregnant woman, should make an examination, and if he does so will find not a few cases of placenta previa. He may get through the cervix, but it may be impossible for him to make out whether there is a central or lateral implantation. In almost every case he will make it out as a lateral one. When the cervix is not dilated, and there is hemorrhage, he must stop that hemorrhage, and to do this he should put the patient in the Sims position, and pack the vagina thoroughly to secure dilatation and control hemorrhage. As a rule, when the packing is removed later on, the cervix will be found dilated. If not, he may repack, or introduce a Barnes' bag or colpeurynter.

Dr. Watkins.—In reply to Dr. Bacon's remarks that cases of ectopic pregnancy should not be operated on at once, I stated in my paper that operation should be done if the conditions were favorable, and where the conditions were not favorable, each case would have to be decided by itself. I would, however, disagree slightly with Dr. Bacon. In a case of acute hemorrhage from rupture of a tube, I do not believe the patient would bleed

much more if put into an ambulance and taken to a hospital than in being placed in bed under the care of a trained nurse. It is not the moving of the patient that causes the bleeding.

Whether there is more shock attending rupture of the tube than tubal abortion is to be determined by the cause of the shock, whether it be due to the amount of blood lost, or to the presence of blood in the abdominal cavity as a foreign body. I have had three cases of abdominal abortions within the last two months. In my experience cases of abdominal abortion do not have shock, at least not very much, and the shock is always proportionate to the amount of blood lost. In reply to the remarks of Dr. Kolischer, I believe I can distinguish between a blood clot and adhesions. In cases where the abdomen is opened for a hematocele, there are well-defined adhesions, except in very recent cases. The roof of the hematocele is not caused by the coagulation of blood, but is formed by firm adhesions of omentum and intestines, and these adhesions are often so firm that it is impossible to separate them without great danger to the intestines. Such cases are suitable for vaginal section and drainage.

The pain from ruptured tubal pregnancy, Dr. Kolischer said, is a diffuse abdominal pain. There is severe pain at the time of rupture, but after that there is very little abdominal pain or tenderness until there is reaction in the abdomen, and whether that reaction be due to the presence of the foreign body, or to the migration of bacteria through the intestines, and formation of toxins, is a question open to discussion. Intra-abdominal pathology would point to the fact that the reaction is due to the presence of toxins as the result of the migration of bacteria through the intestinal walls. As soon as there are firm adhesions and marked round-cell infiltration, there the symptoms are the same as in many cases of infection that produce pelvic peritonitis or more or less general peritonitis.

In diagnosis, the value of the enlarged uterus is a point that deserves consideration; but unfortunately in cases of salpingitis the uterus is also enlarged. In fact, in salpingitis the uterus is sometimes larger than in ectopic pregnancy.

The point was well taken as regards curettage in tubal pregnancy cases. Most cases seen in consultation have been subjected to curettage, sometimes to two or three such treatments. There is danger of injury from pulling down the cervix, but that is much less than the danger of infection from careless curettage. I believe nearly all cases can be diagnosed before rupture or tubal abortion. A careful clinical history will almost invariably show that these patients have colicky pains in one side of the abdomen in the region of the pregnant tube.

I was surprised to hear Dr. Schmauch say that the external hemorrhage came from the tube. We all know that in diseased conditions of the tube it is very uncommon to have any discharge from the tube into the uterus. In removing a hydrosalpinx,

where there is apparently a large opening in the uterus, it is often difficult by forcible pressure to cause fluid to go through the interstitial portion of the tube. In short, it is sometimes impossible, and in tubal pregnancy I have often pressed upon the tube and have found it impossible to force fluid or blood through the interstitial portions. Again, there is not much tension inside these tubes, because the tube wall does not hypertrophy. It becomes very thin and before it is subjected to a great amount of tension the tube either aborts or ruptures. In tubal pregnancy cases the tube is sometimes extremely firm, and in a case of pyosalpinx the tube has at times flaccid walls, so that the apparent tension of the tube as formed on conjoined palpation is not an important diagnostic sign.

Dr. De Lee.—With reference to the use of the terms abruptio placentæ and ablatio placentæ, I want to say that we need a term to express (1) prematurity of detachment, (2) a forcible raising up of the placenta, a tearing away from the surface, and (3) the fact that the placenta was located at its normal site. Neither of the terms presented fulfills those three conditions.

With reference to the remarks of Dr. Kolischer as to the abdominal binder, while I am positive that it is absolutely useless in treating post-partum hemorrhage it may be useful in keeping the gravid uterus down. After the third stage of labor no matter how many pillows are applied, as I have seen, the uterus rises. I cannot agree with him when he says that the abdominal binder is not useful in forcing the full gravid uterus down upon a large tampon that is placed in the vagina. To me, theoretically, such compression is possible, and in one case I exerted considerable pressure by means of a binder, well-fitted, and constantly readjusted.

The next point Dr. Kolischer raised was that vaginal section or any kind of Cesarean section would be inapplicable in a case of normal implantation with abruption of the placenta. To my mind that is not open to his objection. The object, in cases of premature detachment of the placenta with severe internal hemrhage, is rapid delivery. Unless the Doctor can give us some method of checking the hemorrhage, without rapid delivery, then to me rapid delivery by means of vaginal or abdominal Cesarean section offers the quickest method of overcoming a cervix that is not effaced or dilated. The cervix in the case I mentioned was fully an inch and three-quarters long; it was closed, so that a ballroom lead pencil could not have been passed through it. Dr. Webster did vaginal Cesarean section in a case in which the cervix was down in the vagina like a thumb two and a half inches long. While waiting for such a cervix to dilate or trying to dilate it by any other means, the woman has time to die several times. Under the circumstances, in the presence of such a threatening complication, I am grateful to Dührssen for having invented vaginal Cesarean section. Where the vaginal operation can be done, I believe abdominal Cesarean section ought not to be per-

formed. There are men who can do abdominal Cesarean section who cannot do the vaginal, because the technical difficulties of the latter are greater.

I agree with Dr. Bacon as to the practitioner having a definite method of treating placenta previa. Here there is no excuse for quibbling in discussion or for hesitation in practice. The treatment of placenta previa is active, and we should not wait until the woman is almost exsanguinated before instituting radical treatment. In the marginal placenta previas rupture of the bag of waters will usually bring the case to a successful termination in head presentation. Where the cervix will admit two fingers, the method that should be followed is Braxton-Hicks' version or the use of the colpeurynter, depending upon the skill of the operator and the possibilities and conditions of the mother and baby.

Dr. Paddock says that the treatment of post-partum hemorrhage begins at the end of the second stage and ends with the Credé. To my mind, the treatment of post-partum hemorrhage begins in the early months of pregnancy. Fatal cases of post-partum hemorrhage will rarely occur without some underlying cause other than labor. I do not remember to have seen a healthy woman have so much hemorrhage post-partum as to endanger life. The cases of dangerous post-partum hemorrhage occur in those women who are otherwise diseased—hemophilic, syphilitic, or who have a diseased placenta or uterus which prevents the proper course of the third stage. In the treatment of labor cases we must begin in pregnancy and search for evidences of blood dyscrasia, weak uterus, etc. Usually, when the time comes for labor, we are not more than half prepared, because we have not corrected the blood states, and we should have sought to correct them, and other preventable conditions.

Dr. McDermid.—I am quite in accord with Dr. Bacon as to the value of the tamponade, either with gauze or by the breech or leg of the child; but I cannot agree with him in the adoption of these two methods to the exclusion of all others. For example, in a head presentation, with a lateral placenta previa, shall we exclude the use of the forceps? I think Dr. Kolischer mistook the import of my paper when he charged me with advocating the acceleration of labor. I expressly stated, or rather insisted, that there should be deliberate delivery with the forceps, and mentioned particularly the danger of producing serious and perhaps fatal tears of the cervix by manual dilatation and other manipulations. As to the absolute necessity of tamponing all cases of placenta previa after their delivery, I cannot agree. I have not found post-partum hemorrhage of serious import in these cases, and when I do, I shall then find it soon enough to adopt the tampon.

In regard to the application of forceps in undilated cervix, this is after all a relative term. We are taught that the os ought to be three-quarters dilated, but I have frequently used, and shall again apply the forceps in cases of urgency, without that degree

of dilatation. Laceration of the cervix occurs not from the insertion and application of the forceps, but from the violence and rapidity of the traction, just as it may take place even when the cervix is three-quarters dilated when they are applied, and as often occurs in normal labor. When I have occasion to apply forceps thus early, I watch the cervix closely, noting the degree of tension, and I am exceedingly careful not to exceed the limits of reasonable expectation of slow yielding of the cervix; usually one or two or three tractions, with reasonably prolonged intervals of rest, increase the dilation to that stage where the head comes down fully upon the cervix and the shanks of the blades no longer dangerously distend it.

I like the term ablatio placentæ of Dr. Holmes. It is cognate to our English word ablation, and should be easily understood.

Meeting of June 23, 1905.

The President, J. Clarence Webster, M.D., *in the Chair.*

APPENDICITIS COMPLICATING THE PUERPERIUM.

Dr. Rudolph W. Holmes.—These specimens were removed from a woman at the Cook County Hospital. She was admitted to my service about a month ago, which was approximately three months after her confinement at full time. She had a very meager history to relate on her entrance: all that could be obtained from her was that she had been an invalid since the sixth month of the last pregnancy. While previously she was a hard working woman, latterly she was confined to bed most of the time. The delivery was conducted by a midwife; shortly after the child's birth she had chills and fever, which kept her strictly confined to bed. She assured us that she was better than she had been in some months, although the temperature on admission, and for some time thereafter, was 100°–103°, and the pulse hovered about 120; she had only one complaint—a pain through the lower abdomen. Examination showed a mass to the right of the uterus, about the size of a peach, tender, without fluctuation; uterus still somewhat enlarged. For about ten days she was kept in a recumbent position with an ice coil over the abdomen. Then, two weeks after the temperature was approximately normal the operation was undertaken. There were slight adhesions of omentum and intestine to the fundus uteri and the tuboovarian mass, which were rapidly severed. The tip of the appendix was buried in the mass of exudate at the right cornu, and passed over the posterior aspect of the tumor. At first, it appeared as if the appendix was an inflamed tube whose extremity was adherent to the intestine. The appendix, blue-black in color, and about five inches long, was easily removed, and the stump buried after Dawbarn's

method. The inflammatory reaction had made the right cornu so friable it was found impossible to cover over the raw surface without sacrificing nearly all the fundus, so hysterectomy was done, leaving the left ovary. Her subsequent course was interfered with by an abscess of the abdominal wound.

Dr. A. Belcham Keyes.—I recall one case that was quite interesting, in which the appendix was apparently kinked by the adhesion of the omentum to it after labor. The woman had a great deal of pain and rigidity over the right iliac fossa with constipation and vomiting. I was called hastily to assist in exploring the abdomen at the house of the patient; we could not discover any reason for the peritonitis by the median incision but by making an exploration with the hand. I felt more or less crepitation, from the breaking up of plastic adhesions. An extension of the opening was made to the right iliac fossa. We found that the omentum, in falling, had become adherent to the appendix. It was found twisted upon itself in a large mass around the appendix vermiformis. We took out a considerable portion of the adherent infected omentum and removed the appendix. It might have been merely a coincidence; at any rate, it shows that irregularity in the falling of the omentum after labor occurs; it is possible that it may have had some influence in causing the appendicitis. The patient made a good recovery and is still alive. She nursed her child from the time she came out from under the influence of the anesthetic.

Dr. J. Clarence Webster.—I have had a few interesting cases of appendicitis complicating pregnancy, and have seen a number of cases of pregnancy in which appendicitis was suspected. I have seen three of the latter class of cases already this year. I was called to operate on two cases of appendicitis complicating pregnancy, and in each case found that the trouble was not appendicitis at all, but a right ureteritis and pyelitis. In another case which I recently saw in consultation, there was very definite thickening of the lower end of the ureter, which appeared to be the size of my little finger; and the right kidney was evidently infected. The patient was in the eighth month of pregnancy. Labor was induced, and shortly afterward a cast of the ureter was passed, being about two inches in length, consisting of fibrous material, in the center of which was a small calculus.

One case on which I was asked to operate I saw about two months ago, the woman being in the sixth month of pregnancy. Her urine had never been examined; she had pain in the right iliac region, a little temperature and nausea. In this case, as in the previous one, there was a little thickening of the lower end of the right ureter, with pus in the urine. Pregnancy was not interrupted, but improvement took place under treatment.

In another case the woman was pregnant about seven months. She had a right-sided pain, nausea and temperature; the urine had not been examined, and in this case also there was pus. There was tenderness and thickening of the lower end of the ureter, and there was undoubtedly a right-sided pyelitis.

Previous to this year I have seen similar cases, and I believe that it is very important to bear in mind the possibility of ureteritis and pyelitis before operation is undertaken for supposed appendicitis. Attention has also been directed to the occurrence of septic peritonitis following labor as the result of appendicitis, and there is no doubt that that occurs more frequently than we suspect, and probably many a physician has blamed himself for infecting a woman when there has been a stirring up of an old appendicitis. The agreement is general that when a definite or accurate diagnosis of appendicitis is made, no matter what the stage of pregnancy may be, the appendix ought to be removed. I have done so twice in cases of pregnancy within the last two years. In one case labor went on to term, and in the other an abortion occurred.

Dr. Lester E. Frankenthal.—Dr. L. L. McArthur read a paper on this subject about eight years ago. One of the cases he referred to in that article was one in my service at the Michael Reese Hospital, in which I made a diagnosis of appendicitis in the third month of pregnancy. He operated, and I believe that woman aborted. In connection with what Dr. Webster has said, I would utter a word of caution against one symptom. Blood is found in the urine so frequently in connection with appendicitis that it might lead one to infer that the trouble was in the kidney when it is in the appendix. I have seen two cases of that kind that were operated upon, and the appendix was found to be the cause of the trouble. There was nothing the matter with the kidneys and nothing was found in the ureter.

Dr. A. Belcham Keyes.—In line with the remarks of Dr. Webster, I would like to report briefly a case of pyelitis that simulated appendicitis. I saw this case some five years ago in consultation. It was thought to be a case of appendicitis complicating pregnancy. The urine, however, showed a pyeitis to be present, and after labor was over the woman manilested no signs whatever of appendicitis, neither has she had any since. The symptoms of appendicitis, so far as we could determine, externally, were absolute, yet as all the symptoms disappeared after labor the diagnosis is doubtful while that of pyelitis is certain.

Dr. Gustav Kolischer.—Dr. Frankenthal has emphasized a very important point, especially in recent years, when so much attention is being paid by French surgeons to the changes which take place in the kidneys on account of appendicitis. Pinard refers to these disturbances of the kidney in connection with appendicitis, and speaks of a condition which he calls néphrite appendiculaire. In certain cases of appendicitis there is a disturbance in the kidneys, and inasmuch as the kidneys in pregnancy are affected anyhow, they are more susceptible to toxins, and such a case as Dr. Frankenthal has reported might be explained in that way. We know that there may be hemorrhages from the kidney; that the circulation of the kidney is disturbed in some way or other, evidently due to appendicitis. If appen-

dicitis complicates pregnancy, and the appendix is removed, the blood in the urine will disappear again.

Dr. Charles B. Reed.—In reference to the diagnosis of appendicitis during pregnancy, it becomes increasingly difficult as the uterus enlarges, and in this connection I wish to mention a device that has been recently suggested in Germany, namely, turning the woman upon the opposite side, so that the appendix may be more accessible to the examining finger, if necessary, when the woman is near term. I think it is Freund who has suggested this.

CESAREAN SECTION FOR ANKYLOSIS OF BOTH HIP JOINTS FOLLOWING TUBERCULAR COXITIS, COMPLICATED BY MITRAL INSUFFICIENCY AND POST PARTUM ECLAMPSIA.

Dr. Rudolph W. Holmes.—The patient, Mrs. L., was admitted to my service at the Cook County Hospital, April 27, 1905. She was a primipara, twenty-three years of age, and was married a year ago. She had a tubercular coxitis of the left side when six years old; shortly thereafter the right hip became involved. Suppuration in both joints continued until her fourteenth year. Since then she has had no disturbance from the inflammatory process. Aside from the difficulty in locomotion she has had but one other complaint, shortness of breath which developed gradually after the suppurative sinuses closed. She gave no distinct history of rheumatism. The dyspnea became much worse in the second half of pregnancy. Since the seventh month there has been some edema of the feet. Entrance in marital relations was obtained from the back.

Examination. Patient was four feet and ten inches tall, and weighed 100 pounds. Heart was enlarged; a loud mitral systolic murmur was heard at the apex, transmitted to the left. The pulse was accelerated, 90-100 pulsations to the minute. Uterus reached the ensiform cartilage, in fact the fundus was deeply buried under the left costal arch. The child was estimated to weigh 6 1-2 to 7 pounds, but unfortunately this weight was not corroborated after the operation. The position was L. O. A., head high, and freely movable. The knees were found in close apposition, the maximum of abduction being about a half inch; flexion of the thighs was practically impossible: a pseudo-flexion was produced by the mobility of the pelvis upon the vertebra. On standing, the pelvis was noted to have an increased inclination, due to the backward dislocation of the eroded, ankylosed hips. The external measurements were: Spines, 22; Crests, 22; Trochanters, 26; Baudelocque, 18. The right leg was one inch shorter than the left.

The pelvic examination was carried out with considerable difficulty as the legs could not be separated: for this reason it was impossible to estimate accurately the diagonal conjugate; the external hand could not mark the internal fingers. How-

ever, from the ease of palpating the promontory the diagonal conjugate was considered to be between 10 and 11 centimeters, the true conjugate, therefore, being 8 to 9 centimeters.

Her last menstruation was August 20, 1904; labor was due May 27, 1905. The operation was planned to be an elective one, and May 20 was set for the section, for it was essential that the operation should be carried out before labor began, as there was the probability of the head entering the brim: this it was feared would interfere with the extraction of the child. She was examined on May 3 about 10 A. M. At four o'clock that afternoon labor started; although she promised faithfully to inform the nurse at once if pains occurred, she delayed doing so. As a result nearly four hours elapsed before the preparation for the operation was completed; during this period she had strong expulsive pains.

The operation consumed about 50 minutes. The uterus was delivered through the abdominal wound. The uterine incision was made through the anterior wall, where the placenta was situated; the placenta came away at once, with no abnormal hemorrhage. The strong contractions unfortunately had fixed the head in the brim, so the head was delivered with difficulty, losing considerable time; the child was finally delivered dead.

The usual post-operative course was noted. The only events to arouse anxiety were the two eclamptic convulsions which occurred on the 5th, one at 4 A. M., and the second at 8.30. The day before the operation the twenty-four hour amount of urine was 350 cubic centimeters, containing 5 per cent., by volume, of albumin, and urea, 3 per cent. and having a specific gravity of 1,025.

The fact that the head had become fixed in the brim corroborated our suspicion that the pelvic contraction was not necessarily of such a degree as to warrant the section; the indication was rendered absolute by the impossibility of performing any manipulation through the vagina. From a cursory review of the literature, double ankylosis of the hips, due to tubercular arthritis is rare. That she had a post-operative eclampsia adds an interest to the happy outcome. Again I would repeat that it appears to the reporter of this case that the oft reiterated statement of the dangers and technical difficulties met with in placenta previa cæsarea are more theoretical than real. The writer has had two of his cases so complicated, and has observed some six or eight others, operated upon by others, and in none was there any more hemorrhage than is usually met with when the placenta is not in the line of incision.

Dr. Howard Taylor Ricketts read a paper, by invitation entitled,

FUNDAMENTAL PRINCIPLES OF IMMUNITY.*

Dr. Frankenthal.—Why is it that the clinical phenomena of diphtheria are much more speedy in developing than those

* See original article, page 801.

of tetanus? Is it due to the fact that the toxins are slower in developing, or are the tissues more resistant to the one than they are to the other? In diphtheria there is a greater abundance of bacteria than in tetanus, and it is possible that toxin is formed more rapidly and that a larger amount is produced.

Dr. Ricketts.—Ehrlich thinks that the difference in the incubation period between diphtheria and tetanus is explicable on the basis that the toxophorous group of diphtheria toxin acts much more quickly than that of tetanus toxin. One may inject a frog with the toxin of tetanus, and let the animal stay on ice for weeks without the development of tetanus; the disease will then develop if the animal is restored to room temperature. Others explain the long incubation period of tetanus on the basis that the toxin reaches the ganglionic cells only by diffusion through the axis cylinders from the nerve endings, a process which would require some time. We have some clinical evidence in favor of that. For instance, in tetanus in following wounds of the face the incubation period is shorter than when a wound occurs in the extremity.

Dr. Paddock.—I understood Dr. Ricketts to say that one attack of diphtheria renders a person immune.

Dr. Ricketts.—I said often, not always.

Dr. Paddock.—I believe it is generally considered that any one who has had diphtheria is liable to have it again. I know it is the case with certain practitioners.

Dr. Charles S. Bacon.—I would like to ask Dr. Ricketts for a definition of infection, and a distinction between infection and sapremia, for instance, or a distinction between infectious disease and sapremia.

Dr. Ricketts.—Infection is a condition in which some organism, usually a microorganism, causes disease. A sapremia, as I understand it, is a toxemia, and is due to decomposition products of tissue rather than to actual invasion of the tissues with any of the ordinary pathogenic microorganisms.

Dr. C. S. Bacon.—I suppose, after what Dr. Ricketts has said, we have some idea of this term as defined, but I wish particularly to have an elucidation of it in relation to the terms that have been used to-night. Which of the products, as defined by the Ehrlich theory, are present, and how are they present, in cases of sapremia, and why are they present in some cases and not in others? In connection with that, it would be interesting to know, if possible, why in some cases the organisms are harmful, and in others not. Why is there an infection?

Dr. Ricketts.—I have understood by the term sapremia a condition which is due to products of decomposition; that these products are caused by the disintegration of tissue s,necrotic material, by saprophytic organisms, which reside locally but do not gain entrance to the circulation. If that is a correct conception, the toxic substances would seem to have their origin in the necrotic tissue rather than the microorganisms themselves. It may be that microorganisms split up the proteids chemically

just as toxic substances are split off in known chemical reactions with proteids. The organisms themselves in sapremia are not toxic; they do not enter the circulation. Strictly speaking, such a toxic substance would not be called a toxin.

Dr. Bacon.—It is not proper, I understand, to call a saprophytic disease a toxemia in the sense that it is the true toxins of these organisms that are absorbed into the body.

Dr. Ricketts.—Not in that sense, but the word toxemia is sufficiently broad to include such conditions.

Dr. A. Belcham Keyes.—I understood Dr. Ricketts to say that antitoxin did not kill the diphtheria microorganisms. Clinical work seems to show that it does, for the reason that the action of the microorganism apparently ceases from the time the injection of antitoxin is given. I would like to ask Dr. Ricketts to explain this a little more fully. On the other hand, diphtheria microorganisms may be and are found free in the mouth for a considerable time, even three or four weeks after the entire disappearance of the diphtheritic membrane; this I have proven by cultures.

There is also a point in regard to tetanus which was not clear to me, and that is, this disease is supposed by clinicians to be anaërobic, and that it is only in tissues that are partially healed that the tetanus toxin is generated.

I should like to add also in regard to antitoxin for diphtheria, that I have used it in cases of pregnant women in all stages, and also in immunizing young infants with absolutely no harm. This preventive for the pregnant and the infant should be unhesitatingly resorted to in time of need.

Dr. Ricketts.—The action of the antitoxin of diphtheria is not bactericidal; this can be proved by plate culture experiments. It does not inhibit the growth of the organism.

Dr. Keyes.—How do you explain the pseudo-membrane in diphtheria?

Dr. Ricketts.—That becomes intelligible when we think of the action of the toxin itself. The toxin alone causes necrosis of the epidermis and is responsible for the fibrinous exudate. When the toxin becomes neutralized, the microorganisms are no more harmful to the patient than so many foreign particles, and the tissue can at once repair itself. It is likely that in those cases in which the diphtheria bacillus is found in the nose for weeks after the disappearance of the membrane, that they can be found in the pharynx at the same time. But they remain harmless organisms for the patient. Perhaps the antitoxic serum would be naturally excreted in three or four weeks, but in the meantime the individual has been forming an antitoxin of his own, and the antitoxin remains in considerable concentration, for some weeks or months so that the bacilli may remain there for a considerable time without doing any injury to the individual.

As to tetanus being an anaërobic disease, I think what Dr. Keyes has said is correct, as there are many examples of very

dirty wounds with foul earth, which have remained open, but in which tetanus has not developed. On the other hand, tetanus often develops from apparently insignificant wounds which have extended beneath the fascia, and in which the fascia has been closed over and air has been excluded. The rather remarkable claim is made that the tetanus bacillus when washed entirely free from toxin will not cause tetanus. This is perhaps not satisfactorily established, but it is founded on an observation made by some Frenchmen several years ago. Supposedly the presence of toxin would cause a negative chemotaxis hence the leucocytes would not englobe the bacilli. If no toxin were present the bacilli would be destroyed by phagocytosis. In the presence of air the bacilli may produce a sufficient amount of toxin to cause the negative chemotaxis.

Dr. George Schmauch read a paper, entitled,

REMARKS ON ETIOLOGY AND TREATMENT OF RUPTURE OF THE UTERUS AND LABOR AFTER RUPTURE.

Rupture of the uterus above the vaginal portion spontaneously or by violence during labor occurs once in 1500 labors. The typical distension-tear, Bandl's tear of the lower uterine segment, is the result of overdistension in obstructed labor. No rupture occurs in a normal uterus without overdistension. It is predisposed to by previous overdistension of the lower uterine segment and extensive gynecological surgery. Every lesion of the uterine muscle leads to a permanent loss of substance. Repair takes place not by reformation of muscular, but by growth of connective tissue. Localization of the tear depends upon the place and kind of pathological changes causing the predisposition. Rupture may take place in any stage of labor. Diagnosis of rupture is made by bimanual palpation, when symptoms of threatening rupture are followed by those of rupture proper. The former are absent in a uterus predisposed to rupture. Danger of fatal hemorrhage and sepsis furnish the indications for treatment. One-fifth of all cases of rupture die of hemorrhage. Before active interference, the paturient must be delivered quickly but carefully by one of the mutilating operations. Removal of the child by laparotomy is indicated, when it is lying chiefly or entirely in the abdominal cavity, also with absolutely contracted pelvis or when tumors obstruct the pelvic canal. With a possibly fatal hemorrhage, the nature of the tear becomes a secondary consideration to prevention of exsanguination. In a hospital, laparotomy is indicated, in private practice, tamponade of the rent. If a hospital is within a reasonable distance, transfer after packing is to be insisted upon. In the absence of the possibility of transfer or operation at home, delivery by the natural route and tamponade are necessary. In "clean" cases the uterus should be preserved if possible. One should resort to total extirpation the more freely the longer the time which has elapsed since rupture. Conservative surgery with proper selec-

tion of cases gives good results, 22 cases with 13.6 per cent. mortality. Drainage of the peritoneal cavity after laparotomy is indicated only in doubtful cases or after incomplete toilet. The mortality of 246 cases observed in reliable hospitals is 63 per cent. Rupture of the uterus as well as Cesarean section totally destroys the capability of the uterus for subsequent labors in some instances, and in most cases considerably diminishes it. We are not, however, justified in declaring total extirpation of the uterus the only proper procedure in rupture. Whoever intends to save his patient after rupture from further pregnancy and its perils, should satisfy himself with resection of the tubes. The presence of infection is the deciding factor in the operative treatment. Zweifel's suture of the torn serosa is the shortest operative procedure in uterine rupture. In case of pregnancy after previous rupture, the form, situation and mobility of the cicatrix will decide our preference for premature labor, labor in term or Cesarean section. Abortion is rarely indicated. Premature labor gives good results. When any endangering distension is present, Cesarean section should be chosen.

Dr. Charles B. Reed.—I would like to make a few remarks in regard to the mechanism of these tears which Dr. Schmauch has not elaborated quite as extensively as the subject seemed to warrant. He has evidently been dominated by the Bandl theory that all uterine tears occur in the same way, namely, from overdistension of the lower uterine segment. The Bandl theory, which receives support both from Michaelis and Lohs should in reality be called the "incarceration theory," since the mechanism depends upon the fixation of the cervix or a segment thereof between the advancing part and the pelvic brim, in consequence of which the activities of the fundal portion of the uterus produce a gradual thinning of the lower uterine segment until the conditions for rupture are present. This form of rupture most frequently occurs when the axis of the child is oblique and not so commonly when the axis is transverse.

Olshausen and Veit in attempting to explain the inconsistencies and incompleteness of the Bandl theory have called attention to the fact that the lower point of uterine attachment under such conditions is really the vagina and its subjacent tissue which, as is well known, constitute a powerful support and point of uterine fixation below the brim, but this really constitutes an entirely new theory, and, while easily understood, it is not the Bandl theory. When the retraction of the cervix occurs as in transverse cases, we have a very different condition, and one that is not covered by the Bandl theory. Given then a case of transverse presentation with the arm of the child lying before the vulva, the breast and lower body in small pelvis, but with breech and head close together at the inlet, as Michaelis describes, and the vagina stretched to the greatest degree. The conditions are present for a tear, but the rupture will occur in the vaginal vault and not, as the Bandl theory would demand, in the lower uterine segment.

The Bandl theory is explanatory in a large series of cases, but it is recognized that in incarceration of the cervix it is not always present, and by some its occurrence is denied.

The incarceration theory is most valuable in cases of flat pelvis and hydrocephalus and similar instances of spacial disproportion.

Spontaneous tears of the vaginal vault involving the uterus are not frequent, as Koblanck has shown in his report of 80 cases. In this series only 8.75 per cent. occurred in transverse position.

It is commonly accepted at the present time that the great majority of tears in oblique and transverse positions are of violent origin, but of the vaginal vault tears Kaufmann reports 75 cases, of which 35 per cent. occurred in transverse presentation, but only 7 were violent in origin.

The point I especially desire to emphasize is that in transverse presentations the part most exposed to danger of rupture is the vaginal vault and not the lower uterine segment, as the Bandl theory has for too long a time asserted.

Dr. Schmauch.—In reference to the remarks of Dr. Reed as to the Bandl theory of uterine tears, I will say that the theory of incarceration of the lips of the cervix has been taken up and modified by H. W. Freund in such a way that fixation of the cervix should lead to a typical tear, whereas otherwise a uterovaginal tear results. I do not know whether Dr. Reed has examined a woman or not where the cervix has been fixed by the head in the pelvic brim. I have seen cases like that where the anterior or posterior lip became extremely edematous and also observed complete separation of one of the lips, but these phenomena have never been described in rupture of the uterus. This question was discussed freely at the Sixth German Gynecological Congress, and most of the gynecologists were in favor of Olshausen's theory that uterovaginal tears occur in transverse presentations, because the vagina and vaginal vault become extremely distended by the shoulder entering the vagina, and, as I have said, in all spontaneous tears the force is so great, and the tissues are so distended, that rupture of adjacent organs, as, for instance, the vagina, is almost bound to occur. I think that incarceration or fixation of the cerivix in the pelvic brim is not necessary to produce a typical Bandl tear.

TRANSACTIONS OF THE SECTION IN GYNECOLOGY OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting of March 16, 1905.

Dr. W. Reynolds Wilson *in the Chair.**

Dr. A. G. Ellis (by invitation) read a paper entitled

A CASE OF CONGENITAL HEART DISEASE.*

Dr. Coplin.—Dr. Ellis did not state that in this case the child lived 23½ hours with the heart outside the body. From a super-

*See original article, page 847.

ficial examination of the literature I take it that this is the rarest of all malpositions of the heart. One of the most interesting cases of which I have knowledge was one of this kind operated upon in 1888 by Lannelongue. The heart was covered by a thin, transparent membrane only, which by the fifteenth day following birth had sloughed; the operator brought the skin together over the exposed heart; the child recovered.

I have seen two allied conditions—fissure of the anterior chest wall and of the abdominal wall. Of the two instances of fissure of the abdominal wall one was operated on by Dr. Hearn and myself at the Jefferson Hospital, ten or twelve years ago. The thin membrane covering the rectus muscles was removed; the edges of the abdominal wall were brought together. Considerable tension was produced and the infant lived but a few hours. In the light of more recent knowledge, I believe the tension had something to do with the fatal issue. The other case was quite extraordinary. The patient was Dr. Keen's, to whom I am indebted for permission to mention the case. He was a man, probably 30 years of age, who had been an active horseback rider and a cowboy of Mexico, and had consulted Dr. Keen on account of the development of an inguinal hernia. He had a fissure of the abdominal wall extending from the ensiform to the pubes, and was incomplete in the sense of the skin being still present. The muscles were widely separated (congentital diastasis recti). By fixing the diaphragm and contracting the rectus muscles the man could deliver the stomach and a considerable part, I do not know how much, of the intestines out of the abdominal cavity immediately under the skin. The stomach could be palpated, and it was easy to see when the patient had had a meal and when the stomach was empty. So far as I know he had had no particular inconvenience. In most cases of fissure of the anterior thoracic wall and of the abdominal wall, there is associated some other malformation. In the case of extracorporeal heart exhibited by Dr. Ellis, it looks as if the organ could have been replaced within the chest cavity.

I think in those cases in which death has been attributed to a perforate foramen ovale, careful inquiry will discover some other cause. I have seen the interauricular communication most complete without any symptom having been produced. I examined, postmortem, the body of an adult who had led the strenuous life of a notorious character and died of croupous pneumonia. It was suspected during her last illness that she might develop endocarditis, and so the heart was watched most carefully by several distinguished clinicians; there was at no time a single clinical sign of the large fenestrum in the interauricular septum through which a twenty-five cent piece could have been dropped flatwise.

Dr. John B. Deaver read a paper on

HYSTERECTOMY FOR FIBROIDS OF THE UTERUS.*

Dr. Charles P. Noble.—I should have been much more interested had Dr. Deaver's cases been analyzed more strictly, and had

*See original article, page 858.

there been evidence of a careful study of the specimens removed. The fact that he apparently met with so few degenerative changes in the tumors does not indicate that they were not present. By careful examination, I mean macroscopic, and later, microscopic. In speaking of the conditions present in fibroid tumors, Dr. Deaver omitted the conditions that have been recently reported and referred to the older literature only. In the last four or five years the findings in these cases, when they have been carefully studied, have been very different from those reported by Dr. Deaver. What is most needed in the investigation of fibroid tumors of the uterus, is the careful study of each case operated upon. Up to October 10th I had operated upon 326 fibroid tumors.

COMPLICATIONS AND DEGENERATIONS OF FIBROID TUMORS TO OCTOBER 10, 1904.

Abdominal myomectomies	29
Celiotomies	253
Vaginal hysterectomies	7
Vaginal myomectomies	37
Total	326

Adenocarcinoma of body of uterus	8
Epithelioma of cervix uteri	5
Epitheliomatous infiltration of fibroid tumor arising from adenocarcinoma of corpus uteri by metaplasia	1
Sarcoma	2
Syncytioma	1
Myxomatous degeneration of tumor	8
Cystic degeneration of tumor	7
Calcareous infiltration of tumor	7
Necrosis of tumor	19
Twisted pedicle, pedunculated tumor	2
Intraligamentous development of fibroid	21
Procidentia of uterus	5
Retroversion of uterus	4
Adenocarcinoma of one ovary	1
Papillary carcinoma of both ovaries	1
Ectopic pregnancy	3
Dermoid cyst, bilateral; umbilical hernia	1
Dermoid cyst, suppurating; sinus through abdominal wall	1
Dermoid cyst with twisted pedicle	1
Dermoid cyst	1
Ovarian cyst, with twisted pedicle	1
Ovarian cyst, suppurating	1
Ovarian cyst, bilateral	3

Ovarian cyst, unilateral	22
Cystic degeneration of ovaries	6
Abscess of ovary	1
Parovarian cyst	2
Pyosalpinx, bilateral	9
Pyosalpinx, unilateral	4
Hematosalpinx	1
Hydrosalpinx, bilateral	10
Hydrosalpinx, unilateral	8
Salpingitis, bilateral	4
Salpingitis, unilateral	10
Abscess of broad ligament	1
Appendicitis	12
Chronic pelvic peritonitis	1
Total	195

Dr. Deaver's preliminary remarks were the ones with which I least agree; with his general statements about the operation I think most surgeons are in accord. In my judgment the indications for the operation should be based upon our knowledge of the life history of such tumors. We operate upon ovarian tumors because we know that in the majority of cases the patient will die without operation. In the same way, a study of a series of fibroid tumors will show us that about 30 per cent. will die if not operated upon. The question is, shall we operate when the patient is in good condition or wait until the condition is bad. I believe it better to operate when the patient is in good condition. We all do the interval operation for appendicitis, and yet the chances of a patient dying from a secondary attack of appendicitis are less than from fibroid tumor. The indications for the operation should be based upon the percentage of chances of the patient dying without operation or with operation.

Dr. John G. Clark.—For the last few years there has been a tendency to look somewhat askance upon myomectomy, on account of the various objections to it which have been offered. It goes without saying that in women closely approaching or beyond the menopause this conservative type of operation should have no place in surgery; but in younger women, in whom fibroid tumors not infrequently occur, it should be considered, notwithstanding the fact, as Dr. Deaver asserts in his paper, and which is beyond dispute, that it is not as ideal an operation from the sure curative results as is hysteromyomectomy. A recent paper by Menge, however, goes carefully into the results in these cases, and he finds that in by far the larger proportion of cases, the patients are symptomatically relieved, and that there is no recurrence of the fibroid; also that small intramural nodules which may be left behind do not continue to develop sufficiently to require subsequent operation. In no instance has he noted in his own experience, or has he been able to discover in literature, the

rupture of a uterus during pregnancy or parturition subsequent to a myomectomy—a possible sequel which is constantly ascribed to this operation. In his own series of cases a considerable proportion subsequently bore children. In discussing technique, he especially alludes to the dangers of infection, and of hemorrhage into the cavity left after the enucleation of the tumor. To prevent the hemorrhage incident to the enucleation, and to check the subsequent oozing in these cavities, he makes a preliminary ligation of the vessels going into the uterus, adjacent to the tumor area. This he has found to be a very satisfactory procedure, and he strongly recommends it in every case of myomectomy.

As for the general technique of hysteromyomectomy, several points have been brought up with which we may not agree. The employment of a mass ligature is certainly not advisable in any part of the body. Nor can we agree with the methods of drainage which have been adopted in the cases which Dr. Deaver has reported. There are unquestionably two opinions concerning the use of peritoneal infusions of salt solution. Webster, Humiston, Robb, and others have recently reported large series of cases, with an astonishingly small mortality, in a considerable proportion of which peritoneal infusions have been employed. So far as my own experience goes, I see no reason whatever to abandon this method. If a virulent microorganism, such as the streptococcus, is present, I do not believe that any method which the surgeon may employ will materially influence the case one way or the other. I am quite certain, however, that the infusion into the peritoneal cavity of a moderate amount of salt solution (500—1,000 c.c.), accompanied by an enema of at least 1,000 c.c., given while the patient is in the Trendelenberg posture, will very markedly favor the immediate convalescence of the patient, and will guard against irritation of the kidneys, post-operative irritation of the bladder, the increase of thirst, etc. Dr. Deaver attributes the saving of life to intravenous injections of salt solution, which no one can deny. At the same time, if it is not given with the greatest care, serious effects will follow its use. For the last eight years I have very seldom indeed, employed it, for cellular infusions are, to my mind, quite as efficient, and are attended with very little danger. For three or four years in the Gynecologic Clinic at the Johns Hopkins Hospital, intravenous injections were constantly employed, but they were almost entirely abandoned in favor of the intracellular infusions.

Dr. Deaver has criticized the cyclic examination of the abdomen. So far as I am personally concerned, I am sure that where symptoms are somewhat vague and may in part be attributed to some other pathologic condition in the abdomen, especially if these symptoms are digestive, and may come from more or less latent gallstones, the surgeon will do much less harm by careful cyclic examination, than by passing them over without this routine examination, for later the symptoms may become more or less pronounced and require a second operation.

As a result of this failure to make a thorough examination of the abdomen where the history was unquestionably more or less indefinite, so far as a given organ was concerned, I have had occasion, during the last year, to operate upon three patients who have been under other surgeons, and who have overlooked in this way lesions which should have been corrected at the primary operation, and the patient thus have been saved the dangers of a subsequent intervention. Certainly the excursion into the remoter parts of the abdomen, when all of the symptoms are directly referable to the pelvic organs, would undoubtedly be bad surgery. If, however, this cyclic method of examination is carefully carried out under proper precautions and in the proper cases, it will bring much more good than harm to the patient.

Dr. Richard C. Norris.—I agree with Dr. Noble that the most important thing in the study of fibroid tumors at the present time is the careful examination of the specimens removed. This will throw more light than anything else upon the dangers and life history of fibroid uteri. There is little question, now, about the details of operative technique. Men of experience modify their methods and employ the technique that gives the best results. The statistics of the frequency of fibroids and their danger to life, as given by Dr. Noble and Dr. Deaver, do not agree, and taken together, they make the mortality from neglected fibroids ridiculously high. I cannot, as yet, bring myself to believe that every fibroid should be operated upon, but I do not agree with Dr. Deaver that we must wait for pain and pressure symptoms. He emphasized the fact that the associated cardiovascular changes cause death, and that in the cases in which he had mortality, early operation would have saved life. It will be only by careful pathological study of the specimens, and by comparison of mortality rates in the hands of the best surgeons, that we can formulate definite rules to guide us in our advice to patients. Judged by these standards, as they appear in most recent years, the earlier fibroids are removed, the better for the patients.

I believe with Drs. Clark and Deaver in the value of salt solution. The method of introducing it into the circulation is an important point. Personally, I believe there is a risk in septic cases to deluge the peritoneal cavity and disseminate infection. I am confident I have equally good if not better results by routine employment of hypodermoclysis or enteroclysis. I prefer not to risk contaminating the general peritoneal cavity, and have little faith in diluting, and at the same time spreading infection, when it may be present but localized. I have no doubt that Dr. Deaver drains some cases that we, as gynecologists, would not drain. When hemostasis is not complete on account of raw surfaces and adhesions, my custom is to drain through the vaginal vault with gauze, and I almost never use a glass tube as we did years ago. I presume he would drain from the abdominal wound, with a tube, because he has formed that habit from his appendicitis work, which is a different kind of infection from that commonly found in pelvic surgery,

and more often requires drainage. I think the advantage of catheterization of the ureters before doing a hysterectomy has been overestimated, I have frequently tried it, and the pelvic bound tumors, when it would be of particular value, are the very ones that prevent distention of the bladder and make catheterization of the ureters often impossible. Catheterization of the ureters for any purpose is a serious operation, often fails to give knowledge of practical value, and its real usefulness in my judgment has been overestimated.

Dr. George E. Shoemaker.—The two indications for operation which Dr. Deaver laid stress upon, were pressure and hemorrhage. Another indication which I would add is a definite growth of the tumor. As in other portions of the body it seems to me that a growing tumor should be removed. Another indication is the probable interference with labor. I had occasion to remove by myomectomy, a short time ago, a tumor which was lower in the pelvis than the uterus itself, and which previously had, apparently by twisting of the pedicle, caused such distress that the woman walked on her toes to prevent the shock of her heels on the ground.

The continued presence of even a moderate degree of hemorrhage I believe to be unfavorable in the later life history of a patient. When there is no probability of the hemorrhage stopping, we must consider the probable degenerations of kidneys and heart and the gradual reduction of the general vitality resulting in invalidism.

Dr. Charles P. Noble.—The estimate of the frequency of fibroid is far in excess of the working experience of gynecologists. I am sure that not more than one in forty of the women who come to me have fibroids, and of those above forty, not one in thirty. Of course, men who take the old position about the matter are fond of talking about not operating on fibroids that do not have symptoms. As a rule, the patients who do not have symptoms do not come to see the doctor; so on that indication, naturally, a surgeon can operate on all, because all who come probably have symptoms. I would like to refer to what I said in this room a year ago; that, having enjoyed a rather active consulting practice, I have never been consulted by a woman advised by any other surgeon not to have a fibroid removed. So I feel satisfied that the practice of all men in town is much the same. When a case of fibroid tumor is not complicated with bad disease of the adnexia, I doubt whether I have ever drained a case. It is easy to control hemorrhage in operating for fibroid tumor, and to leave the peritoneum perfectly dry, and there is no occasion for drainage. When I do drain, I have found that to remove the gauze through the vagina is a great improvement on the old method of drainage from above.

Dr. Deaver.—I agree with Dr. Noble that my specimens might have shown some degeneration had they all been examined by the pathologist.

Pressure, pain and hemorrhage were the only symptoms the patient complained of. I agree that it is wise to operate in the presence of either a rapidly or slowly growing tumor.

I cannot agree with Dr. Noble in his comparisons of the dangers from fibroids and appendicitis. In our work in appendicitis at the German Hospital, we know that 70 to 75 per cent. of patients who have had appendicitis suffer from recurrent attacks. It must be admitted that some of the recurrent cases die of peritonitis not operated upon. I do not think there is the same mortality from fibroids. Roger Williams considers that one in two thousand is a conservative estimate for unoperated fibroid tumors.

I agree with the propositions that have been made regarding indications for operation. I do not agree with Dr. Noble relative to the question of bleeding. As a matter of course, I never drain a simple fibroid case. As Dr. Noble states, hemorrhage, if it occurs in these cases, is easily controlled. If Dr. Noble never drains, it is evident he does not operate upon complicated cases. A cigarette drain is all right if you have nothing to drain. In some cases I pack with gauze and bring it out through the abdominal wound.

In regard to an examination of the abdomen for other conditions, I believe that in some cases it is important to make such an excursion. In one case recently referred to me in which the reflex symptoms were thought to be due to scar in the cervix, I had no trouble in making out gallstones. I would suggest that the gynecologists look a little more carefully before they take out fibroids. In another case in which ventral suspension had been done, carcinoma developed early and the woman died. Here a further excursion would not have profited the woman. Dr. Norris has spoken about drainage through the vaginal vault, but I do not believe in making two openings in a woman when one will suffice. I remember a remark of Dr. Agnew in the American Surgical Association, in regard to suprapubic drainage, that he never could see the use of climbing up on the roof of a house when entrance could be gained through the cellar door. I believe, however, that Dr. Agnew was wrong. I have been convinced from my experience that a drainage tube above the pubes is more satisfactory than one through the perineum. In complete hysterectomies I drain through the vagina, but not in supravaginal hysterectomies.

I do not agree with the gentlemen that in hemorrhage and shock we have as good results from the subcutaneous injection of salt solution as from the intravenous injections, though that method should not be resorted to as a routine. I recall an instance of death from the intravenous injection of salt solution causing air embolism on account of the cannula being introduced without the solution running.

Dr. Theo. A. Erck reported a case of

SARCOMATOUS DEGENERATION OF A FIBROID TUMOR OF THE UTERUS, WITH REPEATED HEMORRHAGES INTO THE TUMOR.*

*See original article, p. 889.

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF LONDON.

Meeting of July 5, 1905.

The President, W. R. Dakin, M.D., F.R.C.P., *in the Chair.*

ENDOTHELIOMA OF UTERUS.

Mrs. Scharlieb, M.D., M.S., described a case in a woman 50 years of age, who for 11 years had noticed an abdominal tumor associated with hemorrhage and bladder symptoms and thought to be a fibroid. It grew rapidly, and at the time of operation reached 2½ inches above the umbilicus. It was removed together with the uterus and appendages. The patient made an uneventful recovery, and remains perfectly well now, more than 2½ years after. The tumor weighed 44 oz. The uterine cavity was enlarged and measured 3¼ inches in length, the mass bulging into it from the upper part. The mass rose from the fundus in the form of a cyst the size of a six months' pregnancy. The cyst contained spontaneously coagulating, slightly yellow fluid. The wall of the main cyst contained other cysts varying in size from a cherry to a hen's egg. They were filled with clear fluid; their walls were perfectly smooth and lined by a definite membrane, visible to the naked eye. The cysts were lined with a single layer of flat angular cells resembling endothelium. In certain places, however, especially in a definite area in the largest cyst small masses of new growth projected into the cavity. It was thought that the tumor was probably a lymphangioma with small nodules of endotheliomatous new growth in the walls.

MALIGNANT EMBRYOMA OF THE OVARY.

Mr. Targett and Mr. Hicks gave an account of two cases of malignant embryoma of the ovary, including references to the recent literature of the subject. It is remarked that such growths are usually included in the group of teratomata, but on account of their close reationship to the dermoid tumors of the ovary the authors prefer the title of malignant embryoma. They offer the following conclusions: 1. Malignant embryomata of the ovary are rare. They usually occur in young adults, but may be met with in childhood. 2. The tumors may attain a large sizes they are are usually pedunculated, and devoid of adhesions unles; the pedicle has become twisted. 3. Secondary growths are frequently restricted to infection of the peritoneum. They may present the same composite structure as the primary growth, or be wholly composed of sarcomatous elements. 4. Pain and

ascites are constant symptoms; ascites may develop early, even before actual infection of the peritoneum. In several instances a diagnosis of twisted ovarian cyst has been made. 5. Ovarian tumors exhibiting an irregular disposition of embryonic elements are very liable to be malignant.

EXTRAUTERINE GESTATION.

Dr. Boxall showed an extrauterine gestation sac which had ruptured in the fifth month of pregnancy.

Dr. Herman said that after the mid-term of pregnancy rupture of the sac became rarer and rarer as the months went on. There was a broad contrast between the first and second halves of ectopic pregnancy; in the first half rupture was frequent and the risk of operation small, in the second half rupture was rare and the risk of operation great.

LARGE FIBROID UTERUS WITH CALCIFICATION OF THE ARTERIES.

Dr. Fairbairn showed the uterus and appendages, removed by abdominal hysterectomy from a woman of 50, as a well-marked example of arterial degeneration. The naked eye appearance of the uterus suggests a general fibrosis. Further examination showed a distinct increase of fibrous tissue and calcification of some of the uterine arteries. This condition was associated with menorrhagia and consequent anemia and loss of strength.

Dr. Macnaughton-Jones remarked that in these cases of calcification it was noticed that there was previous hyaline degeneration.

Dr. Amand Routh asked if there was any explanation of the menorrhagia which was a constant symptom of these cases. With the atrophic mucosa and the sclerosed arteries one would expect a diminished rather than an excessive menstrual loss.

SMALL INTESTINE ADHERENT TO THE STUMP OF AN OVARIAN TUMOR.

Mr. Herbert Paterson, in showing the specimen, remarked that the condition found might be partly accounted for by the presence of chronic peritonitis at the time of operation, but the specimen emphasized the importance of leaving the pedicle with a smooth surface, free from knots, and especially of obtaining early movements of the intestine.

Dr. Herman asked if anyone had ever opened an abdomen within a few weeks after abdominal section without finding adhesions? He himself had never met with, heard of, or read of, such a case. Adhesions were the immediate invariable result of abdominal section, and in course of time were absorbed.

Dr. Macnaughton-Jones said that he preferred giving salines

instead of calomel when it could be tolerated. He thought the mistake was frequently made of being over-anxious with regard to the bowel.

Meeting of October 4, 1905.

The President, W. R. DAKIN, M.D., F.R.C.P., *in the Chair.*

A paper on

CARCINO-SARCOMA UTERI.

was read by HERBERT R. SPENCER, M.D., B.S., F.R.C. P.

The name *carcino-sarcoma* has been given to cases in which cancer and sarcoma co-exist side by side in the same uterus, *sarcoma carcinomatodes* to cases in which a malignant growth is partly cancerous and partly sarcomatous in structure.

A case of carcino-sarcoma is described. It occurred in the uterus of a sterile married woman, aged 44. Vaginal hysterectomy was performed; recurrence took place within two months of the operation.

In the case described the two growths occupy the body of the uterus, and differ markedly in appearance to the naked eye. Under the microscope the cancer is a typical glandular carcinoma; the sarcoma is of the small round-celled variety.

Abstracts are given of a few similar cases which have been published. The published details are too meagre to enable one to give a complete clinical picture of the disease, which appears to resemble simple cancer of the body in usually affecting sterile patients after the menopause. The sarcoma usually arises in the endometrium, and is lobulated, often polypoid, and, by comparison with cancerous growths, smooth upon the surface.

The writer has met with the co-existence of sarcoma and cancer once out of about ten cases of sarcoma of the uterus, and believes, with Gusserow and Opitz, that a careful examination of all cases of sarcoma will prove that the association is less rare than would appear from the number of published cases.

DR. W. S. HANDLEY suggested that the association of sarcoma with carcinoma might be due to the simultaneous invasion by a parasite of both the epithelial and the connective tissues. But it seemed more probable that any lump in the uterine wall, whether simple or sarcomatous in character, might occasionally so irritate the endometrium as to cause a cancer, in much the same way as a carious tooth may cause epithelioma of the tongue. He suggested that in the specimen shown the sarcoma might have originated from a fibromyoma.

DR. SPENCER, in reply, said that he thought it probable that the sarcoma had origin in a fibroid, and it was possible, though by no means certain, that examination of additional sections might determine that point.

ECTOPIC GESTATION WHICH APPARENTLY RUPTURED TWICE.

Dr. J. C. Holdich Leicester, I. M. S., recorded this case. A Hindustani female, 35, was admitted to the Eden Hospital, Calcutta, on account of severe pain in the left side of the lower abdomen, following two missed periods. She was detained for nine days and then discharged. But two days later she had an acute attack of pain in the lower abdomen on the left side and said she fainted. When readmitted a cystic tumor the size of a large orange was found to the left and behind the uterus. The abdomen was opened and a distended left Fallopian tube and clots were removed. The patient made an uninterrupted recovery.

EXTRAUTERINE GESTATION—OPERATION DURING THE SIXTH MONTH OF PREGNANCY.

Mr. H. J. Paterson described the case of a woman, aged 32, who after three months' amenorrhea, suffered from pain in the lower abdomen and metrostasis. The case was diagnosed on admission to hospital as one of ruptured extrauterine gestation with pelvic peritonitis. But after a few days the patient's condition rapidly improved, the internal bleeding apparently ceased, and all pain disappeared. The lower abdomen was occupied by a globular, tense, elastic swelling which continued slowly to increase in size. The last normal period had ceased on January 12, 1903. On July 22 the abdomen was opened in the middle line. The swelling, apparently situated in the right broad ligament, was separated from adherent intestines and incised. The placenta was found on the front and upper wall of the sac. The deeper portion of the placenta was slightly detached. The placenta was rapidly separated and a living fetus removed. The fetus weighed 11½ ounces and measured 9½ inches; it died a few minutes after removal. The free hemorrhage was controlled temporarily by packing the sac with dry gauze. After a short interval the gauze was removed and the sac irrigated with hot water. Many bleeding points were clamped and ligatured. About two pints of fairly recent blood clot were removed from the bottom of the sac, but much laminated clot was left, as it was densely adherent. The sac was secured to the lower end of the abdominal wound and its cavity packed with sterilized gauze. Severe vomiting followed. On the third evening the patient's condition seemed desperate. As a last resort three grains of calomel were given, followed in a few hours by a turpentine enema. Relief followed. The patient made a tardy convalescence. The sinus into the sac persisted for over a year, ligatures being discharged from time to time.

Mr. Alban Doran considered that packing the sac and ligaturing its vessels were often unavoidable. Unfortunately, the ligatures were apt to become infected, especially when the gestation sac was of the posterior tubo-ligamentary type, in which case the deeper part of the sac was formed by walls of the large intestine.

Dr. Galabin thought that a great advantage was gained if it was in any way possible to remove the whole placental site. In a recent case, operating at about the fifth month, and about a week after the death of the fetus, he had found it possible, by commencing the separation on the unaffected side, removing the whole uterus and tying both uterine arteries before interfering with the sac, to remove entire the adherent fetal sac, including the whole broad ligament in which it originated. The result was that the hemorrhage was controlled after the ligature of the uterine and ovarian arteries, an aseptic field was obtained, the abdomen was closed without drainage, and the patient recovered rapidly without any disturbance.

Dr. Amand Routh considered that packing the sac with gauze was almost invariably followed by infection of the ligatures and a resulting sinus. He thought that calomel was more likely to succeed than morphine in the treatment of the severe vomiting.

Mr. Paterson, in reply, said that complete removal of the sac was impossible in this case owing to extensive adhesions between the intestines and the outer wall of the sac. The use of ligatures was rendered necessary by the large size of the bleeding vessels in the placental site. He believed that the old blood clot at the bottom of the sac became infected owing to its close proximity to the rectum.

OVARIAN DERMOID WITH MINUTE PEDICLE.

Dr. Galabin showed a dermoid cyst of the ovary, 4½ inches in diameter, the pedicle being only one-sixteenth inch in diameter. The pedicle tore through as the mass was being raised and showed no visible vessels. No ligature was required either for the pedicle or adhesions. There was no history or appearance of torsion.

TUBAL ABORTION.

Dr. Galabin also showed a specimen of tubal abortion which was produced by bimanual examination. It was associated with a trivial amount of hemorrhage only, and was accompanied by no distinctive symptoms.

NECROBIOTIC FIBROID.

Dr. Frank E. Taylor showed a fibromyomatous tumor undergoing aseptic necrobiosis or red degeneration. The uterus also shows evidence of recent pregnancy. He expressed an opinion that the part played by pregnancy in the production of this condition is less than often stated. Mr. Alban Doran remarked that pain without hemorrhage or discharge was a well-recognized symptom, indicating necrotic change in uterine fibroids.

TUBERCULAR DISEASE OF THE UTERUS.

Dr. Addinsell showed the uterus from a tubercular subject of 53. Microscopic examination showed tubercules extending from the cervix to the fundus.

REVIEWS.

A Textbook on the Practice of Gynecology. By William Easterly Ashton, M.D., LL.D., Fellow of the American Gynecological Society, Professor of Gynecology in the Medico-Chirugical College, Philadelphia, etc., pp. 1,079; 1,046 illustrations. Philadelphia and London: W. B. Saunders & Co., 1905.

In the preface to this monumental work the author says: "There is, I believe, a place for a practice of gynecology which aims to take nothing for granted in describing gynecologic diseases, and which not only states what should be done in every case, but also gives directions and illustrations so explicit that they may be intelligently and easily followed." * * * *

In following out this plan each subject has been discussed on the basis of the author's own experience, and the method of operation given is that which in the author's hands has proved most satisfactory. The illustrations, to the number of a thousand and forty-six, are all new drawing made under the personal supervision of the author. They endeavor to show each step in diagnosis and treatment as well as in the various operations, and in general are very good. All instruments, needles, and suture material used in any important operation are shown by a drawing. The illustrations of pathologic conditions are wholly diagrammatic, and are made to represent typical lesions.

The text of the book is arranged on an anatomical basis in such a way as to permit of a discussion of the methods of examining each organ before describing its diseases and their treatment.

The opening chapters on the general technic of gynecological examinations, on microscopic and bacteriological examinations and on the blood are practical and excellent. They are followed by chapters on hydrotherapy, constipation, diet, indoor exercises, saline injections, the causes of diseases peculiar to women, and on history taking. The various organs are then discussed seriatim, beginning with the vulva and ending with the ureters. Then comes antisepsis in hospitals with the technic of operations and antisepsis in private houses.

The work contains an enormous mass of detail and information well and clearly presented. There is much to commend and little to censure. It is strong in its teaching of the use of therapeutic and hygienic measures. While in general satisfactory, quite a number of its surgical procedures may be criticised as being not strictly up to date, as, for instance, in the operation for cystocele, where the old superficial ribbon denudation is recommended and no mention is made of the more recent and much more effective method by wide separation of the bladder from the vaginal wall.

A Treatise on the Nervous Diseases of Children. For Physicians and Students. By B. Sachs, M.D., Alienist and Neurologist to Bellevue Hospital, Neurologist to the Mt. Sinai Hospital, etc. Second Edition, Revised. Pp. 571. New York: William Wood & Co., 1905.

In the present edition of this well-known work the omission of the chapters on anatomy and physiology and of detailed case reports and bibliographies has enabled the author to reduce the size of the volume without sacrifice of valuable material. The book now covers the subjects of general nervous diseases and those of the peripheral nerves, spinal cord and brain, including mental diseases and defects. The writer's method of presentation differs from that ordinarily employed, the etiology and pathology of the diseases being discussed after the symptoms and diagnosis. Medical progress since the preparation of the first edition has necessitated a number of changes in the text.

Medical Record Visiting List for 1906. New York: William Wood & Co.

This well-known and popular list is small and light, so as to be easily carried in the pocket, is printed on thin, fine paper, and is firmly bound in flexible covers. It contains a calendar, tables of the duration of pregnancy, a very complete list of remedies and their maximum dose in both the decimal and apothecaries system, besides directions for the treatment of poisoning and other emergencies, and hints on the writing of wills. The visiting list has space for thirty patients a week, with a special memoranda and records for consultation practice, obstetric engagements, vaccinations, deaths, addresses, and cash account.

Transactions of the Southern Surgical and Gynecological Association. Volume XVII., pp. 521. Edited by W. D. Haggard, M.D. Published by the Association, 1905.

This handsome volume contains the matter presented before the society at its seventeenth annual session, held in Birmingham, Dec. 13, 14 and 15, 1904. Among the more notable papers are: A Review of One Thousand Operations for Gallstone Disease, by W. J. and Chas. H. Mayo; The Employment of Celluloid Plates for Covering Openings in the Skull After Operation, by W. P. Nicholson; Decidual Formation throughout the Uterine Muscularis, by Whitridge Williams; Management of Acute General Peritonitis, by Sherrill; and Advances in Renal Surgery, by J. B. Murphy.

Transactions of the American Association of Obstetricians and Gynecologists. Vol. XVII., pp. 277. Published by the Association, 1905. Dr. W. W. Potter, Secretary, Buffalo, N. Y.

This volume contains the constitution, by-laws, lists of officers and fellows and minutes of the seventeenth annual meeting, held at St. Louis, Mo., on Sept. 13, 14, 15, and 16, 1904. Most of the papers and an abstract of the discussions have appeared in this

journal for November and December, 1904. It is needless to recall to the attention of readers the great and increasing value of the material presented before this very active and progressive association.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Metabolism in Osteomalacia.—Raffaele Caporali (*Archivio di Obstet. e Gin.*, July), selected from among forty-two cases under his charge three examples of ostomalacia in different stages of the disease. The first was in a very advanced stage, with intense pain, softening of the ribs with some fractures, absolute immobility, presence of myelocytes and increase of eosinophiles in the blood and marked reaction of Griess in the urine. The second was a much milder case, with much less severe pain, no fractures, and negative Griess reaction and capable of walking with support. The third had slight pains in the chest, staggered when walking without support, and presented less serious alterations of the bones with fair general condition and normal blood. They were put on a prescribed diet and the urine and feces were collected and examined as to phosphoric acid, oxide of calcium, etc. His conclusions are as follows: 1. In severe cases of osteomalacia there is destruction of the albumin of the body, loss of phosphoric acid and of oxide of lime. In milder cases this diminution is less. In convalescence there is no destruction of albumin, and there is a tendency to retain the phosphoric acid and oxide of lime. 2. In two cases there were marked disturbances of metabolism, with decided blood changes; in the third case the blood was normal. The presence of the reaction of Greiss and of blood changes is of diagnostic value. 3. The defects in metabolism bear no relation to the duration, but to the severity of the case, and may be present in the early years of the disease. 4. The composition of not only the bones is disturbed, but also that of all the other tissues, as well as the functions of respiration and circulation.

Gastric Motility in Pregnancy and the Puerperium.—Giuseppe Fossati (*Annali di Ostet. e Gin.*, July) calls attention to the excellent appetite of women during the last months of pregnancy, and refers this appetite to the increase of gastric motility and the increase in the amount of pepsin and hydrochloric acid secreted. He tested the motility of the stomach during the last three months of pregnancy and the first ten days after childbirth, by administering iodopine, a compound of iodine with the oil of sesame, which is not attacked in the stomach, but passes unchanged into the intestine, where it is broken up and the iodine appears in the urine. By administering this and noting the time after which it appeared in the urine he determined

the rapidity of the gastric motility. He found that the motility is increased in the seventh month, and goes on augmenting up to the end of the ninth. After childbirth it is lessened for a few days and then increases again, but not to the degree found in pregnancy.

Laryngeal Tuberculosis as an Indication for the Induction of Premature Labor.—A. Kuttner (*Berl. klin. Woch.*, July 17) discusses the question of whether we are justified in interrupting pregnancy in the interests of the mother when she is the subject of laryngeal tuberculosis. The author has collected from the personal records of a number of writers 83 cases of pregnancy with laryngeal tuberculosis, of which he considers 66. Of these 66 children, 39, that is, 60 per cent., died soon after birth; 10 children were over one year old at the time of the record; 4 were very sickly; 11 died during their first week. Pregnancy rarely occurs in subjects who already have laryngeal tuberculosis. Most of the patients become affected during the early months of pregnancy. The trouble is not at once diagnosed, and goes on rapidly to a fatal issue. The children are frequently born several weeks before term, but the disease goes on to its fatal termination after the interruption. If the mother can be saved, the interruption by artificial means is justifiable; but frequently the process is too far advanced to give any hope of saving the mother, and the life of the child should not be sacrificed. The author gives his conclusions as follows: In diffuse laryngeal tuberculosis pregnancy causes the prognosis to become very bad; the death-rate of children born under these conditions is very large. On general principles the indications are to terminate pregnancy; but only when there is a considerable probability of saving the mother. There is little use in terminating labor in the last months of the pregnancy; tracheotomy gives better results for the child.

Hematoma of Vulva and Vagina.—H. Walther (*Zent. fur Gyn.* July 22), says that hematoma of the vagina is a rare complication of labor. It is given by various authors as from 1–1,000 to 1-3285 cases. There are two forms: above and below the pelvic fascia. When infrafascial it distends the labia majora, and spreads to the perineum and the pararectal connective tissues. When suprafascial it occurs in the connective tissue of the pelvis, and is retroperitoneal. Between these is a form in which the hematoma is suprafascial, and then breaks through the fascia into the tissue of the labium majus. The author describes a case observed by him, in which delivery was attempted by a midwife, which ended in a face presentation. The author delivered by forceps, forcibly rotating the head. Soon after the birth the patient complained of painful pressure in the pelvis, and examination revealed a swelling the size of two fists, filling the vagina. This was at once opened, and after the clot was evacuated, was firmly tamponed with iodoform gauze. The patient recovered. The cause of these lesions is unknown. It

may be a weakness of vessel walls. In the infrafascial form the symptoms are painful pressure in the labia majora, discoloration, uneasiness and anemia. In the suprafascial form there is no swelling to be seen, but it may be felt through the vagina; there is a sensation of pressure in the rectum, and the lumen of the vagina is occluded. The prognosis depends on the size, the thickness of the walls, and the treatment of the condition. A small hematoma may be absorbed under cold compresses and ergot. A large one may undergo spontaneous gangrene and end in sepsis and death. Expectant treatment is allowable only with small swellings and while there is no fever or unfavorable symptom. When these occur the swelling should be opened at once, the contents turned out, the sac tamponed, and the case is treated antiseptically. We should not wait until there are signs of gangrene before operating. If the hematoma occurs before labor, waiting treatment is advisable. If during the puerperal period, operation should be carried out with great caution.

Immobilization in Bed for Hemorrhage During Pregnancy.—Cyrille Jeannin (*La Presse Médicale*, August 26) advocates rest in bed as the best remedy for all forms of hemorrhage occurring in the course of pregnancy. The disadvantages are said to be that the labor is rendered slower by the lack of exercise, and that constipation is produced. The author thinks the first disadvantage is not of much importance, but the second should be prevented by proper treatment. The advantages are many: the removal of congestion of the pelvic organs, the prevention of traumatisms, the improved general circulation, improvement of the digestive functions and the sedative effect on the nervous system. The indications for rest in bed depend on the time of pregnancy. In the first few months hemorrhage accompanies threatened abortion, and in this condition rest in bed, until the hemorrhage ceases is the best remedy. It is also useful at the menstrual epochs. In hemorrhage due to extrauterine pregnancy or molar pregnancy, rest is again a necessity. During the last months hemorrhage is due to detachment of the placenta, or to malposition of the placenta. Here also rest is of the greatest importance, to lessen the hemorrhage and with the chance of continuing the pregnancy until the child is viable.

Albuminuria in Pregnancy and Artificial Premature Delivery.—J. Veit (*Berl. klin. Woch.*, July 3) thinks that albuminuria in pregnancy need not constitute an indication for the premature induction of labor. In some cases this may be necessary, when the amount of albumin is considerable and the symptoms are threatening. There are many cases with small amounts, in which the condition is well borne and the patient goes on to a normal delivery. The presence of albumin in the urine is not always an indication of the presence of a serious nephritis. In chorio-epithelioma and in separation of a normally situated placenta albuminuria has been found to exist.

It is impossible to tell merely by the amount of albumin present whether there is a true nephritis. Often it is possible to make the differential diagnosis only after labor, by the disappearance of the albumin and the clearing up of all symptoms. The secretion of the placenta seems to produce albumin in the blood, which appears in the urine without producing a serious inflammation of the kidneys. Hypertrophy of the left ventricle and eye symptoms will aid in establishing a diagnosis of true chronic nephritis. Under the influence of pregnancy albuminous bodies are found in the urine, which will be precipitated by the serum of animals treated with placental secretion. There may be no clinical symptoms. In other cases there are indications of a nephritis, shown by edema of the extremities. In some cases there are ascites, hypertrophy of the heart and albuminuric retinitis, indicating a true nephritis. If these symptoms are of brief duration, recovery may result; if they continue a long time, nephritis will follow. After a time headache, nausea, etc., will usher in eclampsia. When an old nephritis exists, if there is good compensation in the heart, pregnancy may go on to term. As long as there is only edema of the extremities, the patient should be treated by diet. When headache, dyspnea and eye symptoms come on, premature labor should be induced. When eclampsia is present the uterus should be emptied. In a woman who has nephritis, the first signs of serious involvement indicate the necessity of terminating pregnancy.

Treatment of Syphilis During Pregnancy.—Gaucher (*Journal de Méd. de Paris*, September 10) recommends a treatment that he says will produce a living, well-grown infant at full term in a syphilitic mother, provided it be begun early in the pregnancy when the infection occurs before it, or as soon as it takes place in infections during pregnancy. The important point is the use of a preparation of mercury that is easily absorbable, such as the sublimate in pill form, or the benzoate of mercury for subcutaneous injection, used in alkaline solution. The sublimate is combined with extract of thebane. Of sublimate he gives a centigram, with the same amount of thebane, twice daily. The iodide of potash is seldom necessary. Injections of two centigrams of benzoate of mercury are given once daily. The best way is to alternate series of pills and injections with periods of rest throughout pregnancy. In case of albuminuria the dose is one-half the usual dose, by injection, when the kidneys act well. If elimination is bad, the dose must be two to ten centigrams of tannate of mercury, after a period of milk diet.

Version in Placenta Previa.—L. Demelin (*L'Obstetrique*, September) tells us that version is a useful operation in placenta previa with hemorrhage present. It is practised in one-third of all cases. The high mortality is due not to the operation, but to other accidents of delivery. Extraction should be begun only when dilatation is complete, lest we produce a traumatic

rupture of the uterus during our maneuvers. In order to await dilatation we must use every possible means of arresting hemorrhage, rupture of the membranes, vagino-cervical tamponment, etc. The prudent insertion of the hand into the uterus through the dilatable cervix, so as to bring down the breech is useful. But extraction should not be completed until dilatation is secured. The pressure of the breech will excite the uterus to contraction and facilitate dilatation, while it will check hemorrhage by direct pressure. The application of forceps to the aftercoming head will be avoided, a procedure that is very difficult and dangerous. When there is total placenta previa it is better to separate the placenta on one side so as to reach the membranes, rather than to pass through the placenta itself. Injections of artificial serum, and every possible means of fighting the anemia must be used in the meantime. When anesthesia is used the author prefers ether to chloroform, as less dangerous to the exsanguinated woman.

Cesarean Section in Schauta's Clinic.—Julius Newmann (*Zent. für Gyn.*, July 22) gives the statistics of 175 Cesarean sections done in Schauta's clinic during twenty years, from 1885 to 1905. The chief indication for the section was contracted pelvis. There were 158 cases, 47 of absolute contraction, 111 of relative contraction; six of stenosis of the soft parts, three of tumors preventing delivery, one of malignant tumor, five of eclampsia, two of septic endometritis. There were 141 operations in which the power of procreation was preserved, 15 Porro operations, one total extirpation, and 18 sterilizations with the uterus left intact. Of the 175 patients, 161 lived; 14 died, a mortality of 8 per cent. Of these, eight died of causes not inherent in the operation; two ligatures became detached after Porro operations; one death resulted from the anesthetic; one died of embolism of the pulmonary artery, one of intestinal stenosis, one of pneumonia, one of pyemia, one of peritonitis with malignant tumor. Excluding these we have 169 sections, with a mortality of 4.7 per cent. According to Schauta, the indication for Cesarean section demands a case in which there is absolute asepsis, there having been no examinations by persons with doubtfully clean hands, if we wish to avoid mortality. In cases of moderately contracted pelvis that come to the clinic after several examinations have been made in the attempts to deliver, we are sure to have some deaths. In 111 cases of relative narrowing only two deaths occurred. Of the children, 165 were born alive, nine dead, one asphyxiated, living only half an hour.

Rupture of the Scar of Cesarean Sections in Subsequent Pregnancy.—Richard Werth (*Berl. klin. Woch.*, July 3) tells us that the indication for Cesarean section in contracted pelvis is the greater chance of saving the life of the child that it offers over symphyseotomy, pubiotomy or premature delivery. If it offers as good a chance for the mother as for the child it must be preferred. With modern technique and asepsis the author believes

that it has become a safe procedure for the mother. There may be a question whether it has as good results remote from the operation, or whether the mother is exposed to serious danger from rupture of the scar of the section in case of a second pregnancy. With a view to ascertaining the frequency of rupture of the uterine scar in following pregnancies the author has collected from the literature of the last twenty years eleven cases, to which he adds a twelfth that occurred in his own practice, of rupture of the uterine scar in pregnancy. Some of these ruptures occurred during labor, while others took place before the onset of contractions, and hence were not due to the pains. It is believed that when the placenta is attached over the site of the scar the wall is there weakened by the changes in the uterus due to the placental implantation, so that the growth of the fetus may stretch the uterine musculature at the site of the scar. In ten of the collected cases the rupture occurred before labor. The symptoms are those of severe internal hemorrhage. When the rupture is only partial and the ovum does not pass into the abdominal cavity, there may be only moderate bleeding from the vagina. The bleeding comes from the placenta, which is partially detached, not from the uterine wall. The condition may go on for some time unrecognized when rupture and detachment are only partial. Occasionally the ovum, with unruptured sac, passes into the abdomen, and pregnancy continues without much bleeding. The majority of operators advocate the removal of the ruptured organ by supravaginal amputation, or in extreme cases, by Porro's operation. The author prefers a high amputation, preserving the adnexa and as much of the uterus as possible, so as not to bring on an artificial menopause. As to the cause of the rupture, he believes it is not due to defects in the closure of the uterus after the Cesarean section. The uterine wall should be closed with unabsorbable material, silk being preferable, and every precaution should be taken to secure a perfect union. At the same time there is always a possibility of rupture occurring from weakening of the wall at the placental site.

Cysts of the Human Placenta.—Ernst Runge (*Archiv. für. Gyn.*, Bd. 76, H. 1) gives an account of the reported cases of cyst of the placenta, and presents the history and microscopical examination of a placenta delivered by him after a normal pregnancy and labor, but which presented many cysts. The largest was four and one-half centimeters in diameter; there were six of the size of a cherry, and a large number of smaller ones, from the size of a pinhead to that of a flaxseed. They were on the fetal side of the placenta. On the maternal side were many calcareous infarcts. The membranes were normal. The walls of the large cyst were thick, the contents clear. Under the chorion were many necrotic masses in which were found groups of decidual cells and connective tissue. A small number of chorion tufts were embedded in this tissue. There were also many

cysts of varying size, which originated from the decidual cells by a form of degeneration, a sort of liquid necrosis. The chorion had nothing to do with the formation of the cysts. The author questions whether this degeneration was normal or pathological, and inclines to believe that it was pathological. There were no Langerhans cells present, as was the case with the cysts observed by some other authors; the cells were true decidual cells, and showed no signs of mitosis. The author believes that the white infarcts contained masses of decidual cells. In twelve normal placenta examined by him, in which there were no cysts, there were found white infarcts and the same appearances that were observed in the cystic placenta. Under the chorion lay a fibro-necrotic layer, studded with typical decidual cells. There were coagulation necrosis and formation of infarcts. The connective tissue between the decidual cells and the chorion tufts degenerated, and a dropsical necrosis took place, and small cysts were formed, which coalesced to form larger ones. He concludes that from some unknown cause there is a marked increase in the decidua, from which, under the chorion, and in the central part of the placenta, there is formed a subchorial decidua. This is imperfectly nourished and becomes necrotic, forming white infarcts, and the connective tissue stroma also undergoes necrosis and liquefaction, forming cysts. The amnion and chorion are not at all concerned in this cyst formation.

GYNECOLOGY AND ABDOMINAL SURGERY.

Cysts of the Vagina.—A. Vaccari (*Annali di Ostet. e Gin.*, August) has made a careful microscopical examination of the cysts and vaginal walls in four cases, with a view to establishing the etiology of these cysts. There has prevailed an opinion that these cysts are of embryonal formation. In one case the cyst was in the median line of the posterior wall of the vagina, was thin walled and semi-transparent, and very superficial. There was a communication of the sac with the vaginal lumen on the side toward the vagina. The internal lining was similar to the epithelium of the vagina, and was continuous with it. From his examinations he believes that these cysts may be of embryonal origin, but that more often they are not so. They may arise by an adhesion of the folds of mucous membrane of the vaginal wall, due to a true pathological process, the result of traumatism or of mechanical agents, which produce a more or less serious desquamation of the surface epithelium, and thus facilitate adhesion. In other cases there is a sinking-in and isolation of a portion of the mucosa of the vaginal wall, which, being still endowed with proliferative activity, goes on growing in the substance of the vaginal wall.

Myomata and the Menopause.—Winter (*Berl. Klin. Woch.*, July) combats the old belief that after the menopause myomata became of little consequence, since they go on to atrophy and

are not a source of danger from degeneration. The author believes that, on the contrary, they put off the occurrence of the menopause for some years, and often require operative interference at a time when a healthy woman has passed this period. They also frequently undergo malignant changes. To support this view he has tabulated from 718 cases observed by him, 61 cases of myoma after the menopause had been established for at least one year. Of these, 25 had the menopause between 46 and 50, while in 22 it occurred between 50 and 55 years of age. At the time when the menopause should occur, these patients are a prey to degeneration of the tumor, to rapid increase in size, or to changes in the superposed mucous membrane, which demand operative interference. Of his 61 cases, 4 were operated on for cancerous degeneration of the myoma, 29 for other conditions pertaining to the condition of the growth. These 29 cases consisted of 9 of polypoid degeneration of the myoma, 4 of sarcomatous degeneration, 2 of torsion of the myoma, 6 of severe hemorrhage, 8 of rapid increase in size of the tumor. The author concludes that myomata do not always undergo senile involution after the menopause, but do undergo forms of degeneration that render them a menace to life in many cases. In other cases they continue to increase in size, so that myoma operations at the period of the menopause are far from infrequent.

The Permeability of the Tubes for Fluids Injected into the Uterus.—F. Buttenberg (*Munch. Med. Woch.*, August) tells us that the tubes are not easily permeated by fluids in the abdomen, as in ascites with considerable pressure. Neither is menstrual blood forced back into the abdominal cavity, even when there is a rigid cervix. He has made experiments on the cadaver to demonstrate whether fluids can be forced from the uterus through the tubes by means of a syringe and catheter. In most cases it was found impossible to inject the fluid into the abdomen by way of the tubes. In a small number, a little fluid was forced into it. It required great force and a large amount of fluid to accomplish this. These results, he thinks, show that in intrauterine treatment, fluid is rarely forced into the abdomen, and only when a large amount of fluid is used and a proper aperture for the return stream is not furnished. If there is a double tube for the return of the fluid injected, there can be no danger in intrauterine douches, and deaths from this cause must be rare. Other causes must be sought to account for sudden collapse under intrauterine treatment.

Ovarian Resection.—Paul Zacharias (*Zent. für Gyn.*, August 19) describes a method of resection of diseased ovaries, which he believes to be superior to those previously used. He believes that we can preserve the ovarian function only when we can find, near the tumor, ovarian tissue that has not been destroyed by the growth. In many cases one ovary is entirely destroyed by the cyst, while in the other there are considerable remnants of

ovarian tissue that have not been destroyed by compression. In young individuals it is far better to preserve this remnant, which will carry on the function of menstruation and possibly also that of fecundation, than to have the patient undergo a castration, which will bring on a premature menopause. The normal ovarian tissue should be near the hilum of the ovary, in order to preserve the circulatory nutrition of the tissue so that degeneration will not occur. The tumor is shelled out of the ovary so as to leave intact a portion of the tissue. At the same time a small portion may be taken for microscopic examination, and normal tissue be demonstrated, containing no typical follicles, but showing small corpora albicatia. The author describes three cases operated on by him by this method, in which menstruation continued, in one case for a year after operation, and became as profuse and regular as normal. These cases are too recently operated on to enable us to state whether pregnancy will occur, but this seems quite possible.

Treatment of Acute Diffuse Suppurative Peritonitis.—In reply to inquiries addressed by S. J. Young (*Jour. Amer. Med. Assn.*, August 26) to a number of surgeons, the following indications for treatment of acute diffuse suppurative peritonitis were brought out: 1. Early operation, which implies early diagnosis; 2. method—simple incision with simple drainage, the drains placed in the pelvis and such other fossæ as seem to require drainage perforations should be closed, and the appendix removed, if it be the offender, provided these things can be done without too much handling of the viscera; 3. Fowler position, to retard lymphatic aborption; 4. physiological salt solution by rectum, one and a half pints every two to four hours for twenty-four to forty-eight hours; 5. antistreptococcic serum, in suitable cases, to combat the effect of toxins absorbed.

The Insufflation of Oxygen into the Abdomen in Sepsis, after Laparotomy.—Romolo Costa (*Annali di Ostet. e Gin.*, July) describes two cases of sepsis after laparotomy, in which oxygen was used to counteract the septic symptoms, by blowing it into the abdomen through the drainage tube, so as to distend the abdominal walls. The first case was an extrauterine pregnancy, in which septic symptoms appeared on the third day after operation. The abdomen was immediately opened and washed out with normal salt solution; a drainage tube was inserted and the abdomen closed. The oxygen was then introduced through the drainage tube. There was immediate improvement in the symptoms and the patient recovered. The recovery was not due to the washing out with salt solution, for the author has used that many times in similar cases without the same benefit. The second case was not successful; it was an amputation of a ruptured uterus after a long and difficult labor. Experiments on animals have shown that the oxygen is harmless, and that it is of value in infections of the abdominal cavity with bacillus coli.

The Chemical Rays in Gynecological Therapeutics.—Emilio Curatolo (*Monatsschr. für Geb. und Gyn.*, July) considers the chemical rays a valuable theraputic agency in uterine diseases, since they dilate the capillaries, and stimulate the call changes and the vasomotor nerves, besides acting as a bactericidal agent. He makes use of the rays that do not produce heat, applying the stream of light to the vaginal fornices and cervix, through a double glass speculum. The two specula are separated by a circulating current of fluid, and the light is contained within the inner speculum. If a solution of alum be allowed to circulate, the heat rays are absorbed; if copper sulphate and ammonia be used only, the chemical rays pass, while a red solution absorbs the actinic rays and allows the heat and chemical rays to pass. The speculum is saucer-shaped at its extremity, so as to fit over the cervix and make enough pressure to drive much of the blood from the tissues, as otherwise the chemical rays will be absorbed by the blood. The apparatus is connected with two glass irrigators, which keep up a constant stream of fluid between the two specula. The author has treated 18 cases by this method; six of peri- and parametritis, four of endometritis, four of retroflection with adhesions, three of salpingo-oophoritis, one of spasmodic dysmenorrhea. All have been benefitted. The rays lessen pain, dissipate exudates, change the quality and quantity of secretion in endometritis, and prevent menstrual pain in spasmodic dysmenorrhea. They may cause headache, heaviness and pain in the extremities for a time, so that sittings must be discontinued temporarily. It is the violet and ultraviolet rays that have the beneficial effect. They also have a bactericidal action on tubercle bacilli in the skin. In malignant growths they reach the cells that the knife of the operator cannot, either on account of advanced disease or of difficulty of reaching the parts.

DISEASES OF CHILDREN.

Acid Autointoxication in Infancy.—J. L. Morse (*Arch. of Ped.*, Aug.) reviews the literature of this subject and gives his own observations. He says that the acetone bodies are not found in the urine of comparatively healthy infants and children by the ordinary clinical tests, but appear under approximately the same conditions in adults. Certain digestive disturbances associated with the presence of acetone bodies in early life have peculiar symptomatologies, probably due, in part at least, to secondary acid intoxication. The connection of the symptom-complex seen in many cases of recurrent vomiting with acid intoxication is even closer. Here also the acid intoxication is presumably secondary to some other abnormal condition which may or may not be digestive in origin. Although the amount of the acetone bodies found in these conditions is relatively much smaller than in diabetes, the demonstration of their presence is of importance in diagnosis and treatment.

The Nature of the Atrophy of Infants.—Gustav Tugendreich (*Berl. klin. Woch.*, August 21) tells us that a small number of writers, among them Henoch and Marfan, hold that infantile atrophy is merely a symptomatic condition, such as we find in tuberculosis, hereditary syphilis, etc. The larger number of observers consider atrophy to be a disease in itself, which results from errors in nutrition, and poduces a definite clinical and pathological picture. Parrot, a fair representative of these authors, considers atrophy a malady which has its point of departure in the digestive tube, and produces a profound disturbance of nutrition. The first stage is characterized by frequent passages; the second by watery stools, vomiting, fever, erythema, loss of flesh, thickening of the blood; the third stage shows typical atrophy, ending in convulsions or tetanus, with deep and slow respiration. As to etiology, two groups of causes may be distinguished: first, those arising in the individual, such as premature birth, congenital feebleness, the result of lack of nutrition in intrauterine life from dietetic mistakes or illness of the mother; second, causes outside of the individual, bad feeling and surroundings. Vomiting and diarrhea increase the elimination from the body; lack of appetite lessens the food taken; poor digestion and malassimilation result in lack of nutritive material; the infant consumes his own tissues and atrophy results. The kidneys undergo fatty degeneration, the blood is charged with poisonous substances; uremia and toxemia result. The digestive organs atrophy and ulcerations form. Primary atrophy is not the result of catarrh of the digestive tract, but of poisoning, the result of hunger. Hunger may arise from either too limited quantity or improper quality of food. There may be insufficient absorption, or insufficient assimilation. These children require so much energy for digestion of the food that there is none left for its transformation into useful substances. In many children the reason for a primary atrophy is a congenital weakness of the digestive tract. There may be a disproportion between the nourishment and the digestive secretions; or a disproportion between the material absorbed by the intestine and the biological forces which change it into cell protoplasm. The secondary form is due to digestive disturbances. The whole intestine undergoes atrophy, the walls are thinned, the secretory cells atrophied. The modern theory holds that there is an acidosis, an acid poisoning. There is found an increase of ammonia in the urine of these infants, which indicates an increased production of acid in the system. The source of this acidosis may be the fatty tissues in the body. That atrophy is a cachexia, the result of deficient nourishment, and similar to other cachexias, is the opinion of the author; it is not a true disease in itself.

Treatment of Infants of Retarded Development.—E. Terrien (*La Presse Med.*, August 30) advocates the use of soups of vegetables and cereals, malt soup and buttermilk soup for infants who cannot take cow's milk. The bouillon of vegetables and cereals is made of carrots, potatoes, turnips and dried peas or beans. The vege-

tables are boiled for four hours, and salt is added in the proportion of five grams to a liter of bouillon at the end of the cooking. It should be made fresh every day. From this soup clear mixtures are made and cream of rice, and it is given every three hours, the amount varying with the age of the child. It may be given to children of any age. This feeding may be used for from seven to ten days. It lessens putrefaction and produces rehydration of the tissues. Buttermilk is also useful in acute or chronic gastroenteritis. A soup is made of buttermilk with 10-15 grams each of flour, rice and arrowroot to a liter of buttermilk. Bring the mixture slowly up to a boil, stirring constantly; cook slowly for twenty-five minutes. Add 70-80 grams of sugar. This mixture is very rich in lactic acid, poor in fat, and contains a relatively large amount of sugar and starch. It is to be used as milk is. The children gain rapidly in weight. Malt soup is slightly alkaline, poor in fat and casein. Take 50 grams of flour, 100 grams of extract of malt, one-third liter of milk, one-third liter of water; boil some minutes, stirring all the time. This should be used for children four or five months old. None of these forms of food are to be used for a steady diet, but only for a short time to allow the digestion to improve until milk can be assimilated.

Etiology of Putrid Pleurisy in Children.—Gaetano Melli (*Rivista di Clin. Red.,* August) describes the bacteriological examination of the exudate in two cases of empyema in which there was a putrid odor. In one case there was a typhoid infection and probably a gangrenous focus was developed from a local pneumonic infection in the lung. There were found present in the lung tissues and in the exudate many bacilli of Eberth, as well as streptococci and the bacillus fusiformis of Vincent. This is the first case that has been reported of putrid pleurisy in which the bacillus of typhoid has been found. The microorganisms found are usually the pneumococcus, staphylococcus, tetragonus, coli communis, proteus vulgaris, leptothrix, bacillus of diphtheria, etc. In the second case there was a focus of ulcerative stomatitis, and infection occurred from this in all probability. In the exudate there were found the streptococcus and the bacillus fusiformis of Vincent. This microorganism begins to be regarded as specific of ulcerative stomatitis of the gangrenous type. The bacillus of Eberth was demonstrated to be virulent to animals, and it is well known that when associated with the streptococcus it increases in virulence.

Congenital Multiple Occlusions of Small Intestine.—The case is reported by J. G. Emanuel (*Lancet,* August 12). The child, a seven-months' baby, was admitted as a case of imperforate anus, but an enema was given and meconium passed. Death took place nine days after birth, all food having been vomited. The duodenum was found to be greatly distended, even larger than the stomach. At its junction with the jejunum it was obliterated and

represented only by a band. The first part of the jejunum was distended, and below this another occlusion was present. A similar condition existed lower down, and in five places there were annular constrictions which nearly occluded the lumen. While normal meconium was passed from the rectum, neither bile nor injected food could have reached this part of the intestine. In spite of the occlusions and constrictions the intervening portions of intestine were distended with meconium. This is taken as showing that though bile and desquamated epithelium normally contribute to the formation of meconium, they are not essential, and it is chiefly derived from the secretion of the intestine itself.

Congenital Inguinal Hernia.—Kirmisson (*La Méd. Moderne,* August 16) tells us that congenital hernia need not exist at the time of birth, but may appear later as a result of a congenital predisposition. It may appear very soon, or not until after years, and even in adult life. It may then become strangulated at once, and the intestine will be found in the tunica vaginalis in contact with the testis. The tunica vaginalis should close during the first few days after birth: in congenital hernia it remains open, either throughout its extent or for only a portion of its length. There are two varieties: vagino-peritoneal or testicular, and funicular. The contents consist usually of the small intestine, sometimes the cecum and appendix. The bladder may be drawn into the hernia. Finally there may be only fluid in the sac. There is a marked tendency to spontaneous cure. Strangulation is rare after the seventh year, but may occur in infancy. Strangulation is particularly grave in congenital hernia, on account of the fibrous rings of the canal. The treatment for the first eighteen months is a simple pad and bandage. After the second or third year, if cure has not resulted, an operation should be done. The operation consists of denuding the cord, cutting the sac so as to restore the vaginal tunic, and closing the wound.

Cervical Spina Bifida.—D. J. Davis (*Medical News,* Aug. 12) reports this case. The infant presented a tumor the size of half a lemon at the level of the seventh cervical vertebra and moderate hydrocephalus. There were no mental or paralytic symptoms. At the age of eleven weeks the tumor was removed, but the wound was infected and death occurred from leptomeningitis. The autopsy shows dilatation of the ventricles of the brain and of the central canal of the spinal cord, and at the level of the eighth cervical nerve a narrow tube extending through the pedicle and opening into the meningocele.

Primary Tuberculous Meningitis.—H. W. Cheney (*Chic. Med. Rec.,* August) reports a case of apparently primary tuberculous meningitis. There were typical lesions of this affection whose nature was confirmed by histological and bacteriological examination. There were neither symptoms of other tuberculous involvement nor macroscopic or microscopic evidence of such a process in the peritoneum, gastrointestinal tract, lungs, or lymph nodes,

either superficial, bronchial, mesenteric or retroperitoneal. It is stated that all other organs seemed perfectly normal except for some congestion and edema of the posterior parts of the lungs.

Cerebrospinal Meningitis.—The intravenous or intramuscular injection of mercuric chloride in epidemic cerebrospinal meningitis is suggested by R. Hogner (*Amer. Med.*, Aug. 12). He has employed it in two cases, both of which recovered. In the first case the diagnosis had been made by a physician from the Boston Board of Health and some hypodermic injection given. The writer injected 1.5 mg. of mercuric chloride intramuscularly, and a few hours later 3 mg. This treatment was continued for four days, amount of mercury used after the first day not stated. Silver vitellin was also employed. In the second case two injections were given, one of 3. mg. twelve hours after the invasion, the other not stated. The patient is said to have walked out of doors four days after the onset of the disease.

Kernig's Sign.—R. N. Willson (*Amer. Jour. Med. Sci.*, August) has examined 120 patients who showed complete absence of meningeal symptoms to determine the frequency of occurrence of Kernig's sign in other conditions than meningitis. The sign was considered positive only when the leg, raised gently by the heel, presented a distinct flexion angle of 110 to 120 degrees at the knee when the thigh was at right angles with the trunk. He found the sign in 29 of 73 adults, and 3 of 47 children without signs of meningitis, that is, in 26.8 per cent. of non-meningitis cases. This result, as well as that of 23.6 per cent. obtained by Twiller who used an angle of flexion of 115 degrees, would seem to show that no serious brain or cord disease is necessary to evoke the sign. The writer concludes that while by no means a positive indication of either meningeal or brain or cord involvement, it may be considered as highly confirmatory if associated with other signs of meningitis. Undoubtedly in the majority of cases it persists far into the convalescence and is usually one of the last signs to disappear. In certain cases it probably remains as a permanent indication of a former undetermined lesion.

Hydrocephalus and Posterior Basic Meningitis.—O. Hildesheim (*Practitioner*, August and September) has investigated 128 cases of non-fatal meningitis in children, to determine the part of posterior basic meningitis in the etiology of hydrocephalus. He attempts to show that hitherto cases of hydrocephalus, beginning in the first months of life, have been grouped with those present at birth; also that some of the undoubted cases of congenital hydrocephalus are due to meningitis. He believes also that hydrocephalus is so common a result of posterior basic meningitis that it might almost be considered a symptom of it, as the mild cases are usually treated at home, and are sent to the hospital only when it is noticed that the head is enlarging, when only an incomplete history of the original disease is obtainable. Furthermore, the average age of non-fatal cases is higher than that of all cases,

so that the enlargement of the head is often wanting and the case is unrecognized. In some of these cases symptoms occur like those in older children or adults, in whom hydrocephalus has been demonstrated at autopsy in the absence of cranial enlargement. The writer says also that in the majority of cases of hydrocephalus enlargement of the head begins at the age when posterior basic meningitis is most common; that, at the onset, the presence of posterior basic meningitis can be recognized, in every grade of severity, in those cases in which all the classical features of the malady are present as in those in which only one symptom is present; and that beyond these latter are certain cases which begin at the same period of life, in which no symptoms are recorded at the time of onset.

Leucocytes in Whooping-Cough.—C. G. Grulee and D. B. Phemister (*Arch. of Ped.*, August) have made counts of the leucocytes in fifteen cases of pertussis. From these, and from the observations of others which they quote, they conclude that a leucycytosis is usually present in all stages of this affection. As a rule, the number of leucocytes increases with the increased frequency of paroxysms and becomes less as the paroxysms become less frequent and severe. The mononuclear leucocytes are relatively increased in all stages of the disease. This leucocytosis is present in the catarrhal stage, most marked in the active stage, and gradually disappears. In the paroxysmal stage the lymphocytosis was due largely, in the cases reported, to the large lymphocytes. In the one case in which a count was made in the catarrhal stage, the small mononuclears were in excess at that time.

The Blood in Scarlet Fever.—W. Tileston and E. A. Locke (*Jour. Infect. Dis.*, Vol. II. No. 3) have undertaken a systematic investigation of the blood in scarlet fever. They examined that of thirty-four typical cases, beginning on admission usually, on the second or third day, and continuing until death or complete convalescence. No medication other than strychnine was used, and the blood was taken at such times as to avoid changes due to digestion. They find that the blood of scarlatina in children differs from that in adults only in proportion to the differences in normal blood at the various ages. A slight secondary anemia is the rule in all except the very mild cases. The hemoglobin falls from 5 to 25 per cent., the erythrocytes from 1,000,000 to 700,000, Both return to normal after several weeks. A hyperleucocytosis almost invariably occurs and runs a characteristic course. Rising abruptly on the second to eighth day (18,000 to 40,000) the count falls rapidly for a few days, then more gradually, to reach normal in convalescence, usually after three to six weeks. During the periods of invasion and eruption the polynuclear leucocytes are both relatively and absolutely increased, but decrease gradually with the fall in leucocytosis till convalescence, when they become relatively, though not absolutely, below normal. The mononuclears take exactly the opposite course. With the onset the eosin-

philes disappear entirely or are greatly reduced, rising above normal when defervescence begins. Eosinophilia persists until late in convalescence. Myelocytes are often present in small numbers. Complications, with few exceptions, exert no influence upon the course of the blood. If severe they may increase the anemia, and in a few instances (nephritis and diphtheria) even produce a rise in the leucocytosis. The curve of the hyperleucocytosis may occasionally be of value in differentiating measles. Otherwise, the study of the blood in scarlatina is of no advantage in diagnosis.

Treatment of Ringworm of the Scalp.—According to W. C. Oram (*Dublin Jour. Med. Sci.*, August), the time required for the cure of ringworm of the scalp may be greatly reduced by the use of the *x*-rays. Their employment causes a temporary falling of the hair which removes the fungus. As the loosened hair is liable to cause infection of other portions he now removes the hair from the entire head. The exposures are made for ten minutes on four days a week, the front and back and the two sides being trated on alternate days, so that each area is exposed twice a week. An ointment of salicylic acid is rubbed into the scalp night and morning. By the end of the fourth week scalp is usually bare and free from fungus. The rays must fall perpendicularly upon the area treated, hence the tube should not be within six inches from it, as this would cause localized baldness and dermatitis before the more distant portions were affected. A slight folliculitis, probably due to infection of the follicules with pyogenic cocci, sometimes follows the treatment. No cerebral sequellæ have been noted. The hair requires about three months to grow again, and the new crop appears exactly similar to the old.

Treatment of Ringworm in Schools.—In speaking of the necessity of isolating cases of ringworm in schools, David Walsh (*Brit. Jour. Child, Dis.*, August) describes a method by which this can be practically accomplished without removing the child from school. The scalp is shaved, rubbed with turpentine, washed with soap and water, and dressed thoroughly with a germicide such as a weak solution of formaldehyde or sulphurous acid. It is then exposed to the *x*-ray for ten minutes and finally painted with several coats of a ten-per cent solution of salicylic acid in flexible collodion. A mild irritant remedy may be substituted for the *x*-ray. The collodion dressing is reinforced with cotton or strips of adhesive plaster, if desired, and a fresh coat of collodion is applied in a few days if there is a tendency to cracking. After a week or ten days the collodion cap is raised from the head by the growing hair and may be gently stripped off. This results in complete depilation. The process may be repeated as often as necessary. By this other children are protected from infection by isolation of the diseased scalp; cure is hastened by depilation, which is aided by the *x*-ray or an irritant, and the affected child may continue in school.

Adenoids.—In describing the disease, E. M. Sill (*N. Y. Med.*

Jour. and *Phila. Med. Jour.*, August 12) gives the following picture of its symptoms: The earliest symptoms noted in infants were a thin, watery discharge from the nose, sometimes mucopurulent, which gave the mucous membrane of the nose a reddened and inflamed look and caused excoriation of the lip, open mouth, stertorous breathing, a laryngeal cough, nasal voice, and, in some cases, laryngismus stridulus was present. The babies could not nurse for more than a few minutes at a time without dropping the nipple in order to breathe. In a number of cases these symptoms appeared almost from birth. In such cases the infant had snuffles. In children two or three years old and older the symptoms were more or less constant cold in the head, catarrh, and a seromucous or mucopurulent discharge from the nose, a hacking cough, pinched nose, stupid expression, and where the trouble was of long standing all the symptoms resulting from obstructed nasal breathing were present, such as anæmia, open mouth, malnutrition, narrow, sunken-in chests, with a history of snoring and restless nights.

Eye Symptoms of Infantile Scurvy.—Irving Snow (*Arch. of Ped.*, August) says that sudden exophthalmos in a baby should at once excite suspicions of scurvy. It may be the first indication of the disease. The rapidity with which the proptosis occurs indicates a hemorrhagic lesion. The case which he reports terminated fatally. It was one of typical scurvy, beginning at about nine months in a child fed on cereal milk. Slight protrusion of the left eyeball with blackened lids was followed in ten days by sudden protrusion of the right of so great degree that the lids could not cover much of the cornea. The lids were swollen and ecchymotic. Four days later the infant became feverish, looked ill, and died the night of the following day. Post-mortem examination of the right orbit showed a huge subperiosteal hematoma extending nearly around the orbit and containing pus and bacilli. The infected hematoma was probably the source of the terminal infection.

Astigmatism, a Cause of Vomiting in School Children.—A. Bran (*N. Y. Med. Jour.* and *Phila. Med. Jour.*, August 26) calls attention to the occurrence of regular attacks of vomiting, preceded by dizziness and without gastric pain, in school children, due to astigmatism. The only form of vomiting resembling this is the toxic form, due to uremia. The writer says that in the absence of kidney troubles, in the absence of gastric pain, of fever, chills and epigastric fullness, all cases of vomiting in school children preceded by dizziness, headaches and visual disturbances, can safely be diagnosticated as due to a probable astigmatism.

Syphilis of the Third Generation.—C. F. Marshall (*Lancet*, August 26) puts on record what he believes to be an instance of transmission of syphilis to the third generation, though he acknowledges the lack of absolute proof. The grandmother has the scars of multiple gummata about both knees. The mother at

the age of 16 had a gumma of the popliteal space and extensive destruction of the palate. She married at the age of 19 and had three children, but no miscarriages. The first child has distinct saddle-nose deformity and frontal bosses, but no other dystrophic stigma of hereditary syphilis. The second child died at the age of three years from "bronchitis"; the third child is said to be healthy. The father was not examined. The possible flaws in the evidence in this case are: (1) acquired syphilis in the mother; (2) reinfection of the hereditarily syphilitic mother; (3) acquired syphilis in the father; and (4) the intervention of another syphilitic genitor. 1. In the absence of obvious signs of hereditary syphilis in the mother it is impossible absolutely to exclude acquired syphilis, but extensive or advanced tertiary syphilis at the age of 16 years is strongly in favor of the hereditary disease. 2. Re-infection of a hereditary syphilitic subject with acquired syphilis is known to occur, and the immunity conferred by the hereditary disease ceases at about the age of puberty. The evidence in the present case is in favor of pure transmission, since the lesions in the child are exceedingly mild and also the mother has shown no evidence of acquired syphilis at any time. 3. Syphilis of the father cannot be excluded, as he was not examined; but paternal heredity being apparently a well-established fact, it would be possible for a syphilitic father to beget a syphilitic child with a hereditarily syphilitic mother. 4. The same would apply to another syphilitic genitor in the case of the husband being free from syphilis.

Spirochete Pallida in Syphilis.—Rille and A. Vockerodt (*Müench. Med. Woch.*, August 22) have collected 140 positive observations of spirochetes in syphilis from the writings of various authors; but these observations have not included much variety in the kind of lesions examined. Most of them have been in the primary sore, in condylomata, and in gland affections.. There is need of a wider range of observations. The authors have found spirochetes in 22 lesions from 14 different cases; for the first time they have found them in extragenital primary affections, in psoriasis palmaris, and in papules between the toes and on the scalp. Their results were negative in hemorrhagic syphilis of the newborn, in gummatous osteoperiostitis and in glands. One case is of especial interest in that it had been going on for seven to nine years when the authors found in the genital papules spirochetes resembling refringens. The authors believe that there may be spirochetes which it is impossible to differentiate as pallida or refringens.

V. Babes and J. Panea (*Berl. klin. Woch.*, July 10) records the pathological findings in three cases of congenital syphilis examined by them. Two of them died of hemorrhagic syphilis after some four weeks of life, while the third died at birth and showed syphilitic pemphigus. In the first case all the

organs showed syphilitic changes, and spirochete pallida was found in small numbers in the blood, in combination with streptococci. The blood showed marked leucocytosis. The second case showed typical syphilitic affections of the organs, but no spirochetes were found. In the third case there were profound syphilitic alterations of all the tissues and organs, and spirochete pallida was found in the blood, conjunctival secretion, lungs, liver, lymph nodes, suprarenal capsules, etc. These three cases show that in congenital syphilis every organ is affected. In the hemorrhagic form the blood and blood-producing organs are also affected, and there is a leukemic type.

Tertiary Cutaneous Lesions of Hereditary Syphilis.—Gaucher (*La Méd. Moderne,* Aug. 9) says that the papulo-tubercular syphilides of hereditary syphilis are rare. Gummatous lesions are much more frequent, and form the usual manifestations of tertiary hereditary syphilis. They have the same appearance and evolution as in acquired syphilis, and produce the same disfigurement when they ulcerate and become confluent, or when treatment is neglected. They may destroy the lips, nose or any portion of the face. They may appear on any portion of the body, but are generally single, and appear on the face or the leg. They look like lupus when seated on the face. They consist of a nodular infiltration of the skin, of a dark red color, at first very hard, later softening. They end in ulceration with destruction of tissue, and result in a coppery pigmentation that is typical. They may cicatrize at one point and extend at another, so as to form a serpigenous ulceration. They are very slow in their changes, and are not painful. They look like varicose ulcers when situated on the leg, but they occupy the front of the leg instead of the side, and are punched out and surrounded by a copper-colored areola.

Diagnostic, Prognostic and Therapeutic Value of Lumbar Puncture in the Newborn.—Louis Devraigne (*La Presse Medicale,* Aug. 16) has used lumbar puncture in a number of cases of convulsions, followed by cyanosis and coma, with contractures and rise of temperature, occurring soon after birth in cases of difficult delivery, with excellent results. Such symptoms are the result of hemorrhage between the membranes and the surface of the brain, and lumbar puncture enables the diagnosis to be established, and the condition to be relieved, provided it is undertaken before the child becomes moribund and after the cerebrospinal fluid has had time to become tinged with the red of the hemorrhage. If the hemorrhage has been between the dura and the skull the fluid will remain clear, and the child will not be relieved. But if it is sub-dural the fluid will be red, and one or more punctures will relieve the pressure and save the child. The operation is easy in newborn children, and is absolutely free from danger to the child, who will die if not relieved.

Injections of Sea Water in Infants.—G. Simon and Pater (*La Presse Méd.,* Aug. 19) have investigated the use of injections

of sea water in children the subjects of tubercular lesions of the pleura, lungs and glands. The authors injected five children suffering from tuberculosis, and five with gastrointestinal troubles for the sake of comparison. No benefit was observed from the use of the injections, either to the general or the local conditions. There were no changes in ausculatory or percussion signs in the lung cases. The diarrhea did not improve, nor did the nutritive functions. Each injection produced a febrile reaction, sometimes considerable, having its maxim six hours after the injection. Two cases were aggravated by the treatment; one of these was fatal. The children who had digestive disturbances were also not benefited by the treatment.

Treatment of Enuresis and Polyuria by Epidermal Injections.—W. T. Freeman (*Brit. Jour. Child. Dis.*, August) has had several cures and a number of cases improved by epidermal injections of normal salt solution. The injections were given into the epidermal region at the juction of the sacrum and coccyx. In very young children this is difficult. In the opinion of the writer, males are more amenable to this treatment than females, and the older the patient the more rapidly are good results obtained. In some cases it fails completely.

Valvular Disease in Children.—In speaking of the indefinite manifestations of endocarditis in children, A. E. Childs (*Med. Rec.*, August 5) practically sums up its characteristics in the following definition: Rheumatic endocarditis is an inflammation of the lining membrane of the heart commonly confined to the valves, manifested by stiffness or pain in the joints or tendon sheaths, or in any of the muscles of the body, from the most trivial or obscure form to a well-marked arthritis; by rapid heart action without regard to intermittency or irregularity; by a low grade of fever, oftentimes but a half degree; by a soft blowing, usually systolic, murmur at the apex of the heart, and by the presence of a well-marked leucocytosis.

ITEM.

The committee in charge of the INTERNATIONAL MEDICAL CONGRESS, which will be held in Lisbon from April 19 to 26, 1906, has written asking for the contribution of papers on the following medico-legal subjects, and saying that as yet no titles of communications touching on any of these subjects have been received from this country:

The signs of virginity and of defloration in medico-legal relations.

Hand marks and finger prints; their medico-legal importance.

The medico-legal importance of the curunculæ myrtiformes.

The mechanism of death by hanging.

The value of bacteriologic examination of vulvo-vaginal discharges in the determination of venereal contagion.

The signs of death by drowning.

Ecchymoses in legal medicine.

Spontaneous and criminal abortions from a medico-legal point of view.

Medico-legal investigation of blood stains.

The relations between the seat of cerebral contusions and the point of application of the agent which produced them.

Epilepsy in legal medicine.

The induction of abortion; when is it permissible?

The value of legal medicine in the study of criminal law.

The best legislation for the protection of the "medical secret" (the obligation imposed upon physicians to treat as inviolable all information concerning patients obtained while in the discharge of their professional duties).

The effects of the civil and penal law toward the newborn living infant.

Distinction between the natural openings in the hymen and tears of this membrane.

Criminal vulvar copulation.

Organization of medico-legal services.

If any of the readers of this communication intend to take part in the discussions of this section of the congress, or to prepare papers for it on any of the subjects mentioned, or on any other subject in medicine or surgery, he should inform the Secretary of the American Committee.

RAMON GUITERAS,
Secretary, American National Committee,
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